First Copy

A National Newspaper for Every Branch of the Industry

Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · AVIATION · PARTS · ACCESSORIES · TIRES

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500 S.A.E. MEMBERS BUCKLE DOWN TO TECHNICAL PROGRAM AFTER SESSION ON GOLF LINKS

Monday Morning Session at White Sulphur Springs Devoted to Fuel Discussions; Transportation, Diesel Engine Meetings Held

By WILLIAM C. CALLAHAN,
News Editor

WHITE SULPHUR SPRINGS, W. Va., June 15.—After an orgy of golf yesterday, the 500 members of the Society of Automotive Engineers at the annual meeting at the Greenbrier Hotel here, today buckled down to the more serious work of the gathering with an interesting technical program.

Pleasure was not entirely neglected, and while the men folks were busy with their technical discussions this morning the women of the party opened their qualifying round of their golf tournament. This afternoon the men completed their qualifying rounds which they were unable to complete in the morning due to the technical session then on.

These sessions got under way at 10 a. m. with a meeting devoted to fuel. A. L. Beall of the Vacuum Oil Company presided as chairman and the following papers were presented:

"Further Developments in Determining Gum in Gasoline," by O. C. Bridgeman and E. W. Aldrich of the Bureau of Standards; "Fuel Line Temperatures in 1931 Car," by O. C. Bridgeman and H. S. White of the Bureau of Standards; "Interpolation Method in Detonation Testing," by Donald Brooks of the Bureau of Standards, and "Carburetor Design for the Fuel Research Detonation Engine," by C. S. Kegerries, consulting engineer, Toledo.

Another interesting session today was the transportation session under the chairmanship of F. K. Glynn of the American Telephone and Telegraph Company. Members attending this session heard an interesting paper by D. A. Smith of the Department of Street Railways of

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N. J. TRUCK MEN WILL ASK LEGISLATURE FOR FULL RECIPROCITY LAW

NEWARK, N. J., June 15.—Truck men of New Jersey will make a new effort to obtain full reciprocity when the special session of the Legislature opens. The MacAllister bill to eliminate the fifteen-day restriction on trucks from other states, thereby obtaining similar privileges from New York, probably

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Late News Flashes

New York, June 15.—Henry Ford in an interview with a correspondent of a Swedish newspaper calls the present depression "a recovery from prosperity founded on stock speculation." He also stated that he sees the annullment of the German war debts by the next generation.

* * *

Detroit, June 15.—The Kellett autogiro recently reported in production by Kellett Aircraft Corporation, Philadelphia, is equipped with a Continental 165 h. p. Model A70, Second Series, engine. Continental received the production order for A70 engines in accordance with the initial production schedule of the Kellett autogiro, calling for one ship a week.

* * *

New Haven, Conn., June 15.—Irving Fisher's wholesale commodity price index for week to June 12 below 1913 average at 69.7, as against 70.0 at end of previous week.

* * *

Washington, June 15.—Automotive exports in April had a total value of $19,427,335, a decline of $489,594 from the March total. Passenger car exports were well maintained, but there was a falling off in trucks and parts sent overseas.

Verbatim Reports on S. A. E. Discussion at Truck Rating Session of Summer Meeting

Pulcher and Buckendale Papers Stir Up Unusual Interest; Other Leaders of Industry, Buyers Add Opinions

By WILLIAM C. CALLAHAN
News Editor

WHITE SULPHUR SPRINGS, Va., June 15.—Last evening's technical sessions at the Society of Automotive Engineers' summer meeting drew an exceptionally heavy attendance. **M. L. Pulcher, president of the Federal Truck Company,** presented a paper on "Rating the Truck," and **L. R. Buckendale, executive engineer, Timken Detroit Axle Company,** presented a paper on "A Suggested Basis for Rating the Ability of a Motor Truck." Both papers were printed in full in Automotive Daily News Saturday.

Since these papers were so closely related in subject and theory the chairman directed that both be read before discussion began. Both papers recognized the need for some method of rating the ability of motor trucks and both pointed to the consideration the vehicle gross weight, engine torque, total gear reduction, overall mechanical efficiency, radius of tire under load, gradient and rolling resistance in arriving at truck ratings. Mr. Buckendale's formula was worked out in careful detail and the combined papers covered the field very comprehensively.

The discussion following the presentation of two papers by Mr. Buckendale and Mr. Pulcher on the subject of truck rating indicated that this topic is a very live one with the industry at the present time. A resolution was adopted under which a joint committee com-

(Continued on Page 2)

First Time in the Industry's History

In today's issue of Automotive Daily News will be found verbatim discussions of the truck rating papers, also papers to be read at today's sessions. We believe this is the first time in the history of S. A. E. activities that such discussions have been published within a day of the actual meeting. Rapid, accurate and complete service is the aim of this publication every day of the year.

SOLICITING OF RIDES ON HIGHWAY BANNED BY CONNECTICUT LAW

HARTFORD, CONN., June 15—Nineteen of the forty-six general changes in the motor vehicle laws made by the 1931 general assembly affect owners and operators of private vehicles or pedestrians using the highway, according to a summarization prepared by the State Motor Vehicle Department. They vary from minor technical changes in reports covering accidents to general provisions regulating driving conduct and care of vehicles.

There is only one provision affecting pedestrians, and it is one of the few state laws which directly instruct the pedestrian in traffic conduct. It prohibits the soliciting of rides in a motor vehicle other

(Continued on Page 4)

FOR quick dispatch of S. A. E. news this week, see

William C. Callahan

news editor of Automotive Daily News, who will be at the Greenbriar from June 13 to June 19.

News received in New York by 11 o'clock in the morning will appear in the issue of this paper distributed next morning at White Sulphur Springs. If you have a news item of any kind, see Mr. Callahan. Remember the difference in daylight saving time.

FAIR QUARTER OUTLOOK FOR STEEL OPERATIONS IN YOUNGSTOWN SECTOR

YOUNGSTOWN, O., June 15.—Steel manufacturing operations in the Youngstown district were unchanged last week at 42 per cent. of capacity, with steel buying continuing at a faster pace than expected. The automobile steel business has been contracting slowly as car factory schedules recede, but mill operators here believe that buying from this source is at the bottom. The smaller sheet manufacturers in the district predict a fair quarter in the three-month

(Continued on page 9)

J. H. Moore Predicts Return To Normalcy by Mid 1932

INDIANAPOLIS, IND., June 15.—A return to normal industrial and financial conditions by the middle of 1932, with a gradual improvement during the intervening period, was forecast by Justin H. Moore, counselor on economic conditions of the Irving Trust Company of New York, in the principal address before the annual convention of the Indiana Bankers' Association here.

Industry, the economist said, reached its ebb in January of this year, and he added that there had been a gradual increase in production since then, with the possible exception of May, during which there may have been a slight seasonal lapse.

After reviewing causes leading up to the existing condition of economic stress, Mr. Moore discussed his reasons for believing that the country is on the upward grade economically.

One of the reasons, he asserted, is the fact that few economic depressions have lasted longer than this one. The longest occurred during the '80s, when the depressed condition prevailed fifty-nine months. Another is the gradual readjustment in commodity prices, labor costs and business generally during the last few months.

"Industry," he said "reached its ebb in January, and its volume gradually increased in January, February and March. There may have been a slight decline in May, although my figures for the month are incomplete, and this decline may be increased slightly during June and July, but it is inconceivable that it will reach the ebb experienced in January.

"I can find no basis for assuming that the depression will be of long duration. Twelve or fourteen months from the ebb probably will see it brought back to normal conditions. I believe there will be an upturn during the second half of this year, and that business generally will be back to normal by the middle of next year.

"One of my principal reasons for

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Builds Up Service by Watching 'Little' Details

Story on Page 4

Verbatim Reports on Truck Rating Session of S. A. E.

(Continued from Page 1)

posed of members of the truck activity committee and the transportation and maintenance activity would study the question and try to arrive at some acceptable method of truck rating.

In calling for discussion, **Chairman H. W. Alden, Timken-Detroit Axle Company**, declared that there are just two things wrong with the truck business. One is that nobody has money to buy trucks and the other is that in the truck business under the present rating system the buyer cannot tell what he is buying. He likened it to buying the same suit of clothes at prices varying from $15 to $100.

T. C. Smith of the American Telephone and Telegraph, speaking from the buyer's angle said the rating question is particularly vexing at the present. He suggested that trucks should be divided into two groups: one containing heavy duty or lugger models for slow speed draft work, and the other to carrying materials and delivery service. Under this plan the three-ton, or 18,000-pound, truck in the lugger type would have a different rating than the delivery service truck.

"If some one would line up the specifications for what we consider an 18,000-pound truck it would help a great deal," he said. "That would not only include the engine part, because that is only part of the problem—if you put a smaller engine and a large reduction in the rear axle, you can negotiate hills, but not so rapidly. However, there is some work in which the smaller engine could be used in connection with the larger rear axle reduction which, with an engine having a higher top speed, would give fair road speed after the bad hills had been negotiated."

C. A. Pierce, Diamond T, took up the discussion: "I feel that Mr. Buckendale's paper is worthy of a good deal of consideration. I think that a formula of this kind can be made to work because I have been using it for several years. There is, however, one other consideration that has to come in and that, of course, is speed. I wonder if trucks will not be rated in the future, or will not be held to certain speed, depending upon their gross weight, by state laws, which will narrow the problem down to certain speed limits. That is one consideration which would make the formula as suggested fairly simple as to operation.

"When you are considering the engine, gear ratio, spacing of the engine, the total weight and size and the speed factor, that factor will have to vary with some locali-

(Continued on Page 4)

SPARKS from DETROIT

* * *

Michigan for Shatterproof

* * *

Applied to Motorboats

* * *

Wild Bob's Daughter

* * *

Chris Sinsabaugh—Detroit Editor

GOV. BRUCKER of Michigan, signing the bill requiring shatterproof glass to be used in all vehicles used to carry passengers by January 1, 1932, and demanding that privately owned motor cars be so equipped by January 1, 1934, calls attention to the interest lawmakers are taking in this safety fitment.

As matters stand there are bills of a similar nature under consideration now in Pennsylvania, Connecticut and California in this country, while Canada is waiting for the excitement over the tariff to abate before acting on the suggestion of a Nova Scotia member of Parliament that after August 1, 1931, all automobiles manufactured in the Dominion shall be equipped with safety glass.

Both the House and the Senate in Pennsylvania concurred in the measure demanding that all buses and omnibuses be safety-glassed throughout, but Gov. Pinchot, instead of signing the bill, sent it to the public utilities commission. Connecticut also leaves it up to the public utilities commission to pass on the suggestion that all public service motor vehicles use shatterproof. The California bill is still pending. On the Coast they want, after January 1, 1932, all new cars to be that way; that public hire vehicles be thus safeguarded.

* * *

LEGISLATION that already has passed is reported from New York city, Massachusetts, the city of Minneapolis and Great Britain. Manhattan demands safety glass throughout the passenger sections of taxicabs. Massachusetts limits it to windshields on public vehicles. Minneapolis has set October 16, 1931, for its deadline, after which time all windshields and windows of taxicabs must give this sort of protection.

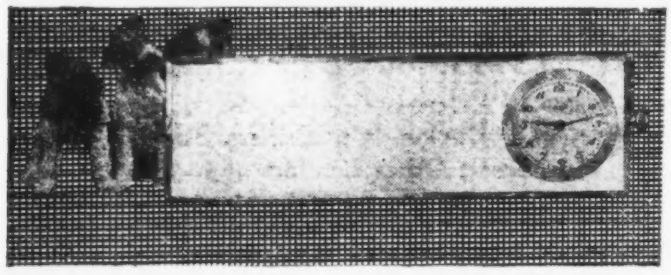
Great Britain has been the crusader in this movement. There safety glass is required on all motor vehicles registered as new cars after January 1, 1932. After January 1, 1937, all motor vehicles operating on English highways must be so fitted.

* * *

AS we finished writing about safety glass legislation, there came into the office none other than our predecessor as column conductor, Fred Kingsbury, now advertising manager of that up and coming motorboat concern, Chris-craft of Algonac, Mich., who gave us a new slant on the shatterproof stuff. It came along with the announcement that Chris-craft this week is putting out an eighteen-foot runabout that is to list at $995, a remarkable price considering the average heretofore has been around $1,200. The model has a speed rating of thirty miles an hour, also unusual, and comes completely equipped.

"Safety glass is coming in strong with the motorboat people," said Kingsbury. "We have it on our

(Continued on Page 16)



This New and Attractive Clock-Mirror Combination

The ultimate refinement in interior equipment. Precision constructed. Designed by experts. The wide-vision mirror is 8" x 2½". Handsomely finished. Finest glass with deep bevel. Lists at $17.50. JAEGER timepieces are regular equipment on Cadillac, La Salle, Minerva, Packard, Hispano-Suiza, Isotta-Fraschini, etc., etc.

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E. L. Veil, Vice-President

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Quality Commands Attention

Used Exclusively on CADILLAC-LA SALLE

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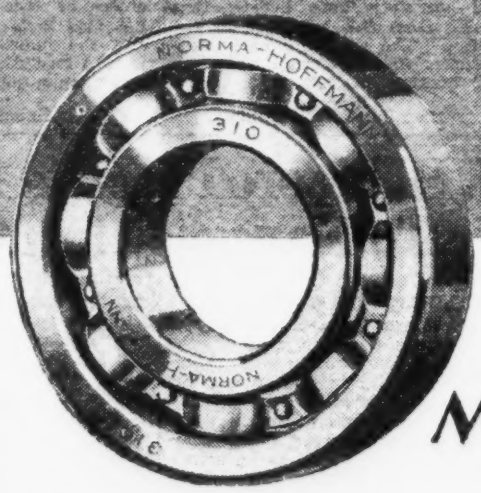
Division of Borg-Warner Corporation.

Morse Chains Are Standard Equipment on

AMERICAN			
Cadillac V-8	De Vaux 6-75	La Salle 8	Reo Flying Cloud 8
Cadillac V-12	Dodge Bros. 6	Lincoln 8	Reo Royale 8
Cadillac V-16	Dodge Bros. 8	Oakland V-8	FOREIGN
Chrysler 8	Durant 6 (614)	A manufacturer of high grade eights (Name on request)	Adler
Chrysler 8 De Luxe	Durant 6 (617)		Audi
Chrysler Imperial 8	Essex 6		Brennabor
Continental Motors	Hudson 8		Fiat
De Soto 6	Hupmobile 8 (C-100)	Peerless 8 (Model B)	Hansa Lloyd
De Soto 8	Hupmobile 8 (H-133)	Peerless 8 (Model C)	Vauxhall
	Hupmobile 8 (U-133)	Pontiac 6	Wanderer Werke
	Hupmobile Century 8	Reo Flying Cloud 6	Zschopauer



There's MORE MILEAGE *in* PRECISION BEARINGS

"NORMA-HOFFMANN"
PRECISION BEARINGS
BALL, ROLLER AND THRUST
NORMA-HOFFMANN BEARINGS CORPN.-STAMFORD CONN. U.S.A.

Streamlining Offers Many Design Advantages

Beauty, Improved Vision, Comfort, Elimination of Engine Noise, Vibration and Odors Due To Rear Engine Mounting, Unit Construction, Low Cost, Claimed

By WALTER T. FISHLEIGH
Consulting Engineer, Detroit

The following, in part, is a paper to be presented today before the summer meeting of the Society of Automotive Engineers at White Sulphur Springs, W. Va.:

If we started out today to design a fast automobile and were not handicapped by precedent and fashion, said automobile would not look, or act, or be mechanically arranged like present automobiles.

When the automobile was originally designed, twenty-five or thirty years ago, it was a slow-moving vehicle—the next step forward from the horse and wagon.

At that time, when original styles and arrangements were established in all major particulars, there was perhaps reason and justification for simulating in appearance and general arrangement, the horse-drawn runabout or milk wagon.

At that time, furthermore, reliability and speed were conspicuous by their absence, and any consideration of aerodynamic design, which is so tremendously important to high-speed travel through air, would then have been quite farfetched.

In the beginning, the so-called "horseless carriage" was simply a carriage without a horse, and engineers religiously attempted to preserve this idea by appropriating the conventional design of horse-drawn runabout or Victoria carriage, simply omitting the horse, the shafts and the harness and hiding the engine under the seat or in the deck behind the seat.

This style and arrangement did not last long, for two reasons: First, the public began to talk about and demand more horse power and wanted to see evidence of it; secondly, there simply wasn't room for increased horse power under the seat of the conventional buggy.

Thus was conceived the idea of the engine out in front and the passenger compartment behind.

Only a few years were necessary to convince Mr. and Mrs. Public of the joy and inspiration inherent in the versatile privately owned automobile. Having established its reputation for reliability and convenience, it was only logical that manufacturers and owners began to look to comfort and luxury, and to think of a closed or partly closed body.

In 1911, several companies furnished, for cold or inclement weather, complete curtain enclosures, but even prior to this date the demand and need for a so-called "closed body" had been met by manuafacturers in almost every price class.

The Ford Motor Company, in 1910, advertised and introduced the closed Model T coupe as an "ideal winter car for business or pleasure," and Packard marketed perhaps the most elaborate limousine of its time.

By 1913 the conventional present-day closed-body style and general appearance and arrangement had been developed, as illustrated by the Hudson sedan of Fig. 1.

Comparing the last with a typical 1931 sedan, designed almost twenty years later, shows surprising similarity in general outline, general arrangement and general aerodynamic non-adaptability to high-speed travel through air.

Considering again the closed sedan, which I think we will all agree represents fairly well the typical 1931 car, we are astounded at two facts.

(1) That this general outline has remained practically the same for almost twenty years. (2) That this general outline simulates so strikingly the horse-drawn milk wagon of 1931 or of 1913.

Our typical 1931 sedan is like the milk wagon, not only in having its horse power out in front of a vertically-ended, wind-disturbing, box-shaped body; it even simulates it in the matter of ears at the front and louvers on the side of the horse power compartment.

It was the above perspective of the general situation which led the writer several years ago to undertake, with his assistants, a synthetic development of a fast automobile, as if the start were being made from scratch and all of the various features of the car could be given proper relative scientific weight without any handicaps of precedent, style or fashion.

Later, minutely accurate, quarter size models were biult and check tests run in a modern aerodynamic wind tunnel.

Today, as everybody will admit, the automobile is no longer the uncertain, temperamental, slow speed, short distance car of twenty-five or thirty years ago, when its general style and arrangement were established. Today it is an entirely different vehicle. It is a reliable long distance vehicle, and one of its outstanding requirements and virtues is speed.

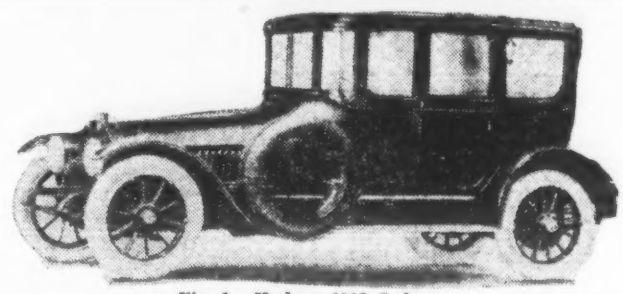


Fig. 1. Hudson 1913 Sedan

Today, moreover, not only engi- public knows that for high speed travel through air there are remarkable advantages from the standpoint of power economy and speed, in shapes which offer least resistance and are, therefore, best adapted to aerodynamic travel.

Today, morover, not only engineers, but the public is familiar with and accustomed to and likes the beauty and symmetry of full streamlined bodies.

But few people, and indeed few engineers, realize that at 30 to 60 m. p. h. a properly shaped body will travel through air with one-third the resistance of an improperly shaped body of the same volume.

Translated into automobile terms, this means that if we design an automobile today in the form which we know would be best, it would travel through the air with one-third of the air resistance of present models. And, since air resistance at touring speeds is the greatest part of the total resistance of an automobile, this means that, with the proper shape, an automobile can be made to travel from two to two and one-half times as far on a gallon of gasoline, depending upon the speed.

Few people appreciate that an ordinary cylinder has four times as much air resistance at any speed as the same cylinder with its end properly shaped or "streamlined" for air travel.

A modern automobile, with its many exterior air-disturbing appurtenances, such as fenders, lamps, hardware, bumpers, axles, wheels and extra tires, offers about five times as much air resistance or drag at any speed as a full streamlined airplane body of the same passenger-carrying volume.

With these startling but well-established observations as a background, we proceeded. Assuming at the outset the number of passengers to be accommodated in an automobile design and the desirable dimensions between seats, steering wheel, roof and so forth, we proposed to throw about them a modern full streamline enclosure and then study the resulting structure with

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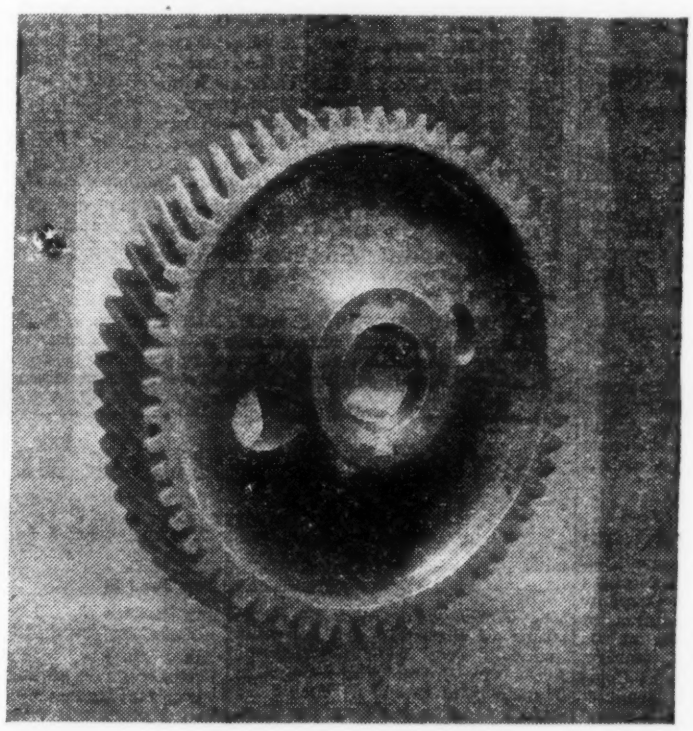

F = Ma

Do you want to reduce M?

TEXTOLITE TIMING GEARS

A NONMETALLIC gear affords the lightest known front-end drive. The material has a specific gravity less than half that of aluminum. Most of the mass of the gear is concentrated near its center, while at the rim, where the velocity is high, the mass is very small. This results in the lowest possible equivalent mass to be accelerated and decelerated.

This reduction in inertia is one of the reasons why representative cars in price classes from the Ford to the Cunningham use timing gears.

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GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

Dealer Emphasizes Cleanliness in Servicing Cars

New Haven, Conn., Hudson-Essex Firm Pays Unusual Attention to 'Little' Details; Finds System Helps Sales Too

ATTENTION to "little" details, with particular emphasis upon absolute cleanliness in handling of cars, has built service business for the Erwin M. Jennings Company, Hudson-Essex dealership with showrooms at 250 Whalley Ave., New Haven. Having in mind the strong objection of women to grease or oil on any exposed part of a car, mechanics are required to use the utmost care to see that everything is left spotless.

Slip covers are always used, of course, but the service department does not let the matter go at that. Every car is carefully inspected after the job is completed, to make sure that no speck of grease lingers on the steering wheel, upholstery or any other part.

Through its care in handling service work, the dealership has found an avenue to new car sales, according to Garrett E. Lambert, service manager. Not only does high-grade service on new cars mean a repeat sale later on, Mr. Lambert has found, but many used-car buyers are later brought into the fold for a new model.

When a new car owner brings his car to the shop he is taken to Mr. Lambert, who starts a little chat and inquires as to what can be done. Mr. Lambert makes it a point to devote fifteen minutes to each new car owner who comes in, answering questions about the car and otherwise being helpful.

"We have found that if a customer returns for three check-ups he generally can be depended upon for future business," Mr. Lambert says. "If properly taken care of, he will continue to return, not only for service but for his next car. Thus, there is a definite connection between the sales and service departments which it pays to cultivate."

Servicing of used cars is handled with great care, due to the dealership's belief in a policy of cultivating new car prospects. Full tests are given before work is started, and Mr. Lambert gives his personal attention to used cars as well as new.

Service letters sent to a list of owners every spring and offering special combinations on valves, lubrication, oil, radiators, etc., have proves successful in bringing in much extra business, according to Mr. Lambert. The large volume created by these special offers makes the work pay, as well as bringing the owner into the shop.

SOLICITING OF RIDES ON HIGHWAY BANNED BY CONNECTICUT LAW

(Continued from Page 1)

than a public service motor bus or taxicab from within the limts of the traveled part of any public highway, except in the case of accident or emergency. A fine of not more than $10 is set by the Legislature for the violation of this statute.

Among the important new provisions is one which prohibits crowding of the front seat of a vehicle. Another law prohibits the passing of a vehicle on a hill or curve where there is not a clear, unobstructed view of the highway ahead. It also provides that any vehicle passing shall not return to the right of the highway until the rear end of the vehicle has cleared the vehicle passed by at least twenty feet.

CHANTER, PIERCE-ARROW, CHOOSES CASEY AS AID

Buffalo, N. Y., June 15.—The appointment of Matthew J. Casey as assistant to the general manager of the Pierce-Arrow Motor Car Company is announced by A. J. Chanter, vice-president and general manager. Mr. Casey will function in connection with all branches of sales and advertising.

For the past thirteen years Mr. Casey has been associated with MacManus, Inc., automotive advertising agency of Detroit. His training and experience are expected to prove of material assistance in the extensive merchandising plans now under way in the Pierce-Arrow organization.

APPOINTMENT OF DEALERS FOR DE VAUX ANNOUNCED

Grand Rapids, Mich., June 15.—R. H. Mulch, general sales manager of De Vaux-Hall Motors Corporation, announced the appointment of the following new dealers of De Vaux cars: West Point Garage, Chambersburg, Pa.; Marmon Company of Johnstown, Pa.; Ream & Eisenberg, Rose and Buttonwood Streets, Reading, Pa.; C. F. Pfeiffer Motors, Inc., 1381-90 Haddon Ave., Camden, N. J.; Brewer Bros., Inc., Canaan, Conn.; Brewer Bros., Inc., Rutland, Vt.; West Side Garage, Castleton, N. Y.

Offers Service Inducement

USED CAR SALE

Thursday Friday Saturday

Down Payment As Low As **$25.00** Select a Car That Is Within Your Means

A Good Used Car Is a Good Investment

150 TO SELECT FROM

Increased Sale of the New 1931 Chevrolet, Due to its Outstanding Performance and Wonderful Value, Has Brought in Many Excellent Used Cars, Which We Are Offering at Extremely Low Prices. Your Present Car Taken as Part Payment. Our Reputation Is Your Protection. Thousands of Our Owners Recommend Foley Chevrolet Co. as a Good Place to Buy Used Cars.

150 TO SELECT FROM

FREE SERVICE For Five Months FREE

A Complete Chassis Lubrication Once a Month for Five Months; Complete Car Inspection Each Month for Five Months; Motor Oil Washed Out and Refilled Each Month for Five Months. The Above Service Is Given to Each Used Car Purchaser During This Sale, Without Charge.

WILL HOLD CAR FOR FUTURE DELIVERY
With Small Deposit

All Prices Have Been Cut, Regardless of Cost, for This Sale

Sample Bargains

	Down Payment		Down Payment		Down Payment
'28 Chev. Coach	65.00	'28 Chev. Coach	83.00	'28 Nash Sedan	139.00
'30 Chev. Sedan	164.00	'26 Whippet Coupe	43.00	'30 Chev. Coupe	147.00
'28 Essex Sedan	89.00	'28 Chev. Coupe	75.00	'27 Whippet Sedan	45.00
'26 Chev. Coach	25.00	'29 Whippet Sedan	105.00	'28 Chev. Sedan	95.00
'30 Ford Coupe	130.00	'26 Buick Coupe	65.00	'25 Essex Coach	25.00
'26 Packard Sedan	105.00	'27 Whippet 6 Coupe	63.00	'25 Buick Coach	83.00
'28 Ford Coupe	63.00	'29 Chev. Coupe	123.00	'25 Hud. Brougham	43.00
'30 Chev. Spt. Coupe	154.00	'28 Chev. Rdstr.	35.00	'30 Ford Tudor	130.00

ONE OF NEW JERSEY'S LARGEST AUTOMOBILE DEALERS

FOLEY CHEVROLET CO.

Open Evenings 10 o'Clock Phone Mitchell 2-6400

957-959 BROAD STREET NEWARK, N. J.

Open Evenings 10 o'Clock Phone Mitchell 2-6400

THE FOLEY CHEVROLET COMPANY of Newark, N. J., has found three-day sales in its used car department a quicker method than long drawn-out affairs. In a recent sale the concern also took advantage to tell of its recently adopted plan of five months free service

Verbatim Reports on Truck Rating Session of S. A. E.

(Continued from Page 2)

ties. I believe the states, the legislatures of different states are waiting right now for the Society of Automotive Engineers and the N. A. C. C. to point the way. They don't know how fast a truck can go. They are going to expect us to help them.

"If we can narrow the range of speeds for vehicles of a certain gross weight, we eliminate the uncertainty or the one absent factor in this formula, and, knowing that engines have certain displacement, very certain limited engine speed, we can narrow down that factor. We can then arrive at a fairly simple solution to this problem, which I think has been so well presented by Mr. Pulcher and Mr. Buckendale."

F. K. Glynn, American Telephone and Telegraph: "It seems appropriate at the time to bring forward resolution that a joint committee of the truck activity committee and the transportation and maintenance activity committee be formed with the view to study truck rating and bring forth some generally acceptable method of rating trucks."

J. F. Winchester, Standard Oil of New Jersey: "I am inclined to think that one of the difficulties with the motor truck industry is that questions of this kind have not been decided earlier. At the present time there is a distinct tendency on the part of legislators to legislate against the use of the motor truck because of past abuses. It is my opinion that the motor truck industry will not come out of the present depression unless problems of this kind are solved."

Fred C. Horner, General Motors Truck Company: "I don't think this problem is going to be solved by the engineers or the manufacturers. I think it has to be solved by the users of motor trucks. I don't care what formula you set forth, or what your salesmen tell them, the average user figures that if you tell him he has a 2-ton truck he is going to put four tons on it. I would be very glad to support Mr. Glynn's resolution that we form a committee and see what we can do with it."

Mr. Hughes, United Railways, Baltimore: "As an operator of both trucks and buses I would like to say that I think this resolution is very important, and I think Mr. Horner has perhaps overlooked the fact that the users and operators are working on the present information. As it now is, the engineering information is not available to manufacturers. Some method of rating truck and bus chassis is most important.

Mr. Pulcher: "Mr. Winchester brought up a point that is extremely interesting, and that is a question of truck taxation. I think the last record we had was about 5,000 bills in the many states in which they were kicking up truck taxation. A man like Mr. Winchester, who drives a great many thousand trucks, ten, fifteen, twenty-five dollars apiece extra runs into millions of dollars.

"If we had a rating that was an actual engineering rating I think we would eliminate a lot of those things.

"I am of the opinion that some sort of a basic rating of what is a truck of a certain capacity might help us on taxation matters very much."

W. S. James, Studebaker Corporation: "In listening to this discussion it seems to me that there is one point that hasn't been mentioned, that is, if a standard, such as Mr. Glynn suggested, were made it would go a long way to simplify the designing engineer's problem."

P. P. Pierce, Vacuum Oil Company: "I do not think that all of this should fall on the shoulders of the operators. I think the operators should sit in on the committee, but if the designer cannot start out and design a truck by knowing the tires and all the details first then he isn't much of a designer."

A. C. Herreshoff, Dodge Brothers Corporation: "I want to thank Mr. Pulcher and Mr. Buckendale for their fine papers. I think it is a

(Continued on Page 13)

STEP-UP FOR CHRYSLER IN CINCINNATI SECTOR FEATURES MAY SALES

CINCINNATI, June 15.—Automobile registrations in Hamilton county, O., in May, showing a 13.7 per cent. decline compared with sales in April, and a total of 11.5 per cent. under that of May, 1930, were featured by the fact that increases were shown in only seven types of cars, ranging from 1.6 to 2,200 per cent.

The latter jump, however, hardly can be considered in comparative reckonings for the reason that it represents a "clean-up" sale of Marmons, at a price cut of about $250, the J. A. Gross Motor Car Company, Marmon dealer, selling only one car in April, compared with twenty-three last month.

Step-up in Chrysler sales of 119.7 per cent. between April and May figures was the outstanding factor revealed by the month's figures. Following Chrysler came Hupmobile, with an increase of 81.2 per cent.; Studebaker, 50 per cent.; Pontiac, 5.8; Willys, 4.7, and Reo, 1.6. Oakland sales broke even in the two months, records in the county clerk's office showing four sales each month.

Decreases revealed in sales of some of the more popular cars also caused comment, particularly the case of Lincoln, with four sales registered in April and none last month. Other decreases revealed were La Salle, 75 per cent.; De Soto, 66; Cadillac, 58.3; Oldsmobile, 40.4; Graham, 35.5; Packard, 31.6; Buick, 30; Essex, 29; Dodge, 28.6; Ford, 19; Chevrolet, Pierce and Hudson, 18; Auburn, 12.5.

A coincidence in connection with the monthly figures lies in the fact that of the total of 1,630 new car sales, Ford and Chevrolet accounted for 27.7 each, or 55.4 of the whole.

Used car sales for the month were 6,270, compared with 7,114 in April, a decrease of 844, or 13.4 per cent.

MONTHLY AUCTION CLEARS OUT CHEAPER USED CARS IN CONN.

A monthly auction to clear out cheaper used cars not sold during the month has proven profitable for the Cooley Chevrolet Company, 158 Whalley Ave., New Haven, Conn., according to J. J. Cooley, president. Cars are sold to the highest bidder, one at a time, regardless of price. As the cars involved are only of the cheapest types, the price brought is not a major matter, as the number of live prospects attracted by the auction is a worth-while factor.

"At each auction we always sell quite a number of cars by having our sales force mingle with the crowd," Mr. Cooley said. "This tends to strengthen our relations with the prospect, as well as accomplish actual sales. From fifteen to twenty cars are sold each month on the auction block.

"This past April was the biggest month in our history. We sold a total of 429 cars, 212 new and 217 used. In May we sold 182 new cars and 209 used. This month so far is ahead of any previous June by at least 25 per cent. Our used car stock is now the lowest in history. In fact, at present we have but nine days' supply of used cars on hand."

GOODYEAR OBTAINS LEASE UPON TRENTON WAREHOUSE

Trenton, N. J., June 15.—The D. G. Nicholas Company, jobber, has leased a large warehouse at 533-539 Adams Ave. to Goodyear Tire and Rubber Company. The Goodyear company is moving its wholesale business to the new address, which is in the center of automobile row. The D. G. Nicholas Company will continue in its original quarters, which will be enlarged.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

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Long Life—Dependable Power

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Automotive Daily News

"Of, By and For the Entire Automotive Industry"

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Each in Its Place

L. A. DOWNS, president of the Illinois Central Railroad, in a recent statement regarding the present situation of the railways, remarked that "traffic which must rely upon railway service must learn to bear all the cost of it, if traffic which has an alternative is fairly or unfairly taken away."

Mr. Downs, of course, refers to the diversion of traffic formerly handled by the railways to motor buses, motor trucks and even passenger cars. He assumes, as so many railway men do, that some of this diversion was "unfair"; that the bus and truck lines are subsidized by the public because they are permitted to use highways built from funds raised by taxation.

Forgetting for the present the question of just how "free" the highways are to buses and trucks, which pay an enormous volume of taxes into the state treasuries, suppose we examine the proposition in its broader aspects.

Experience has proved that motor transportation fills a definite need in our modern American life, social and commercial. Motor trucks and motor buses provide certain types of transportation that are more advantageous to the users than that of the railways. Considered broadly this means short-haul transportation. Neither buses nor trucks are seriously competing with the railways in long-distance haulage.

The situation is not entirely clarified as to just how far motor transport maintains a superiority. But of this we may be sure, that motor transport will eventually be used only in so far as it is superior to railway haulage.

It may be that it will be necessary for the railways to increase freight rates for the particular type of haulage which they are better equipped to handle than highway vehicles. No industry, railway or otherwise, can be expected to operate without profit. If conditions have changed so that the railways cannot make money at present rates, then the tariffs will have to be altered to meet the new situation. That is fundamental.

But the idea that the proper way to meet the new situation is to kill the competition that has proved valuable to the people of the country on the whole is distinctly a non-constructive solution of the problem.

It may be that the railways will prove to be best fitted to take over the various forms of commercial highway transport and operate them. If this is to the benefit of the general public it should be allowed, but there should be ample protection of the public interest. The railways certainly should not be permitted to take over bus and truck lines and then kill them to drive traffic back to the rails. That would be retroactive and would deprive the public of a valuable form of transportation, which it has already accepted as part of its normal life.

There will undoubtedly have to be a "shaking down" and co-ordination of our transportation system, giving each type, rail and highway, a chance to develop and broaden its service in the best interests of the public.

The Sales Peak

EARLY returns on May sales in the various states indicate that 1931 will follow the general pattern by carrying its sales peak in April. This has been the ordinary course of sales, though the rule has been broken more than once.

If sales for the rest of the year follow the usual pattern, there will be a steady decline month by month to the end of 1931. In a year so off the traditional line in so many ways it is not safe to rely too far on precedent. Any number of factors may push the sales curve up, even if only temporarily. An upturn in the stock market, showing signs of permanent revival, would unquestionably release money now in savings banks and other safe depositories for purchases in the automobile as well as other fields.

HARTFORD DEALER GROUP OUTING ON TUESDAY

Hartford, Conn., June 15.—Members of the Hartford Automobile Dealers' Association will hold an outing June 16 at the cottage of A. C. Hine, Oakland-Pontiac distributor, at Bantam Lake, a summer resort. The entertainment committee having charge of the affair consists of A. A. Neilsen, F. W. Williams and Mr. Hine. Prizes will be awarded the winners in sports events.

The association members feel they have need of rest and recreation after a strenuous winter, made doubly so by the heavy burden involved in handling legislative matters. A great volume of motor vehicle legislation went through the mill at the 1931 session of the Connecticut General Assembly, which has just closed. Attorney Kendall Pierce, counsel for the association, handled the legal details, while Executive Secretary Arthur Fifoot also played an active part.

CAMDEN FIRM SELECTED BY HUPMOBILE, DE VAUX

Camden, N. J., June 15.—The latest development in the automobile industry in Camden comes with the announcement today of the appointment of C. F. Pfeiffer Motors, Inc., as dealer for Hupmobile and DeVaux.

With the opening of its showrooms at 1388-90 Haddon Ave., the Pfeiffer company takes up sales and service of Hupmobile as an already established line in this territory, and becomes the first De Vaux dealer in this city.

Associated with Pfeiffer as general manager is Ben F. Miller, who has been connected with various Hupmobile dealers in Camden and South Jersey since 1929. Prior to that time he was part owner of the Millwood Motor Company, former Chandler dealer.

HARTFORD FIRM FORMED AS DE VAUX DISTRIBUTOR

Hartfor, Conn., June 15.—De Vaux Connecticut Corporation has been formed to act as distributor for the new De Vaux Six in this state. E. H. Dieckhoff heads the corporation, which has main offices at 285 Broad St., Hartford. C. A. Joyce will be wholesale manager and Edward I. Fischer will have charge of retail sales.

Edward F. Ibelle, Inc., 908 Maple Ave., Hartford, has been appointed a metropolitan dealer. Applications for dealerships are being received from many sections of the state.

COMING EVENTS

JUNE

14-19—**White Sulphur Springs, W. Va.** Society of Automotive Engineers, summer meeting.
15-18—**Madison, Wis.** American Society of Mechanical Engineers, fourth national oil and gas power meeting.
17-19—**French Lick, Ind.** Steel Founders Society, mid-summer meeting.
21—**Montlery Track, France.** Automobile Club of France, grand prize race.
22-26—**Chicago, Ill.** American Society for Testing Materials, thirty-fourth annual meeting.
22-27—**Boston, Mass.** National Association of Credit Men, convention.
29-30—**Chicago, Ill.** National Association of Taxicab Owners, meeting.

JULY

4—**Altoona, Pa.** Automobile race.
19—**Nurburg-Ring, Rhineland, Germany.** Automobile Club of Germany, grand prize race

SEPTEMBER

1- 3—**Cleveland, O.** Hotel Statler, Society of Automotive Engineers, twentieth annual aeronautical meeting in conjunction with National Air races.
8-17—**Utrecht, Holland.** Utrecht Fair, bus and truck show.
16-17—**Atlantic City, N. J.** National Petroleum Association, annual meeting, Hotel Traymore.
20-26—**Springfield, Mass.** Eastern States Exposition.
21-25—**Boston, Mass.** American Welding Society, meeting.
28-29—**Atlantic City, N. J.** National Association of Motor Bus Operators, fifth annual meeting, Hotel Ambassador.
26-Oct. 2—**Atlantic City, N. J.** American Electric Railway Association, annual meeting.

OCTOBER

1-11—**Paris, France.** International Automobile Salon.
2- 3—**Houston, Tex.** American Institute of Mining and Metallurgical Engineers, petroleum division meeting.
12-16—**Chicago, Ill.** National Safety Council.
14-16—**Pittsburgh, Pa.** Society of Industrial Engineers, convention.
15-24—**London, England.** International Motor Exhibition, Olympia Hall.
22-28—**Prague, Czeche-Slovakia.** International Automobile Exposition.

Complete Technical Program Of S. A. E. Meeting

THE complete technical program for the annual summer meeting of the Society of Automotive Engineers, meeting at White Sulphur Springs, W. Va., June 14 to 19, is as follows:

TUESDAY, JUNE 16

10.00 A. M. Auditorium

PASSENGER CAR BODIES

L. C. Hill, Chairman

Comfort and Interior Appointments—H. A. Brunn, Brunn & Co., Inc.
What the Body Engineer Wants in a Chassis—R. F. Anderson, Murray Corporation of America

8.30 P. M. Auditorium

PASSENGER CARS

W. C. Keys, Chairman

The Tear-Drop Car—W. T. Fishleigh, consulting engineer, Detroit
Driving High Speed Cars—J. E. Hale, Firestone Tire and Rubber Company

WEDNESDAY, JUNE 17

10.00 A. M. Auditorium

FUTURE DEVELOPMENTS

W. J. Davidson, Chairman

The Field for Synthetic Lubricating Oils—F. W. Sullivan, Jr., V. Voorhees, P. T. Oak and D. P. Barnard, Standard Oil Company of Indiana
The Case in Favor of Cars With Rear Engine Mountings—Herbert Chase, Product Engineering and American Machinist

STANDARDS

Arthur Boor, Chairman

Reports of the various divisions will be presented and acted upon

2.00 P. M. **Field Day**

8.30 P. M. Auditorium

SEMI-ANNUAL BUSINESS MEETING

President Vincent Bendix in the Chair

AIRCRAFT

Dr. G. W. Lewis, Chairman

Flying With the Navy—Hon. D. S. Ingalls, assistant secretary of the navy for aeronautics

10.00 A. M. Ballroom

THURSDAY, JUNE 18

10.00 A. M. Auditorium

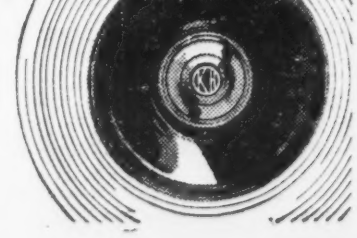
AIRCRAFT ENGINES

Arthur Nutt, Chairman

(Continued on Page 13)

With each spoke permanently secured in place, equal tension is secured throughout the entire circumference of the Kelsey-Hayes steel spoke wheel. A perfectly aligned, perfectly balanced, true-running wheel, of great strength and longevity is the result.

WOOD · WIRE · DISC WHEELS



Motoring Public Desires Comfortable Cars

Style Should Be Built Around Comfortable Seating Layout—Seat Design, Materials and Construction Important—Sound Insulation Difficult Problem

By H. A. BRUNN
President, Brunn & Co., Inc., Buffalo, N. Y.

The following is a paper to be presented today at the summer meeting of the Society of Automotive Engineers at White Sulphur Springs, W. Va.

Twenty-five years ago America's foremost actress said to me, "If it is stylish I will get in on my hands and knees."

This remark was made because I told her that a certain design of special body which she desired would be difficult to get in and out of. I tell this instance because, since that day, I have waited upon hundreds of people and ninety-nine out of a hundred desire first to be comfortable.

Do not think I am going to push style into the background, for such is not the case. It has been proved that it is possible to secure both style and comfort in the same vehicle. After thirty-five years of experience, I have come to the conclusion that there is only one method to pursue if one wishes to secure both style and comfort; that is to first lay out the seating arrangement and then surround the seating arrangement with the outline.

I realize that many smart-appearing close-coupled cars are being sold, but I also know that many of these are soon replaced by other cars that are more comfortable.

Recently I sat in the rear seat of a very smart close-coupled body, but when I tried to cross my legs it was impossible to do so without wiping my shoes on the back of the front seat. This incident reminded me of the story of the family that lived in a very small apartment. The maid's room was so small that it would not accommodate a full-size bed. Maids were continually leaving the employment of this family because they could not sleep comfortably. Finally, one was secured whose work was very satisfactory and who continued to remain without making any complaint. One evening the master of the house decided to investigate after the girl had retired. He crept upstairs and, opening her door an inch or two, looked in, and there, underneath the bed, neatly parked side by side, were two wooden legs.

When I sat in the close-coupled body just mentioned, I thought it would be a wonderful job if one could remove his legs and lay them in the bottom of the car. Do not forget that you cannot cut a piece off the passenger. This remark has made many of our patrons laugh, but it is true. The owner wants to be able to get into his vehicle and take all of his anatomy with him, and it is possible that he would like to take some luggage.

Soft cushions and lazy-backs are of little use in an ill-proportioned seat; in fact, I would prefer a hard seat and back of the right proportions to a soft cushion and back that was not properly proportioned.

We always begin by laying out the chassis in full size on our blackboard, showing the steering column, pedals and gearshift levers in their correct positions. A certain distance must be allowed between the steering wheel and the face of the upholstery, and a certain distance for the springs and hair used to provide the lazy-back. This method locates the panel against which the front-seat back will rest. We have a certain distance that we must allow from the face of the lazy-back to the front edge of the cushion, and a certain distance from the floor to the top of the cushion at its front edge. These dimensions may vary somewhat, but not to any great extent.

It seems that it will be only a matter of time when all bodies will be built with adjustable seats, both front and rear. Passengers vary so much in their physical dimensions that it is practically impossible to make permanent seats that are comfortable for all. An adjustable seat virtually assures a comfortable seat for either large or small passengers.

Another important factor that enters into comfort is the location of the seat on which the cushion is to rest. Great care should be exercised to have the seat frame the correct height from the floor, and we should be assured that it has the correct amount of slant or slope. This is especialy true regarding the rear-seat frame. All of the blame for uncomfortable seats must not be placed on the body builder. We often encounter a chassis so constructed that we are confronted with the problem of building a comfortable rear seat over a large dish-pan that sometimes projects two or three inches up into the bottom of the cushion.

No matter what cushion springs are used, it is practically impossible to make a comfortable seat over such a pan. For many years we have used an hour-glass type of woven-wire mattress construction. We have experimented with many other types, but none has given such complete satisfaction; but even this type of spring will fail to give satisfaction unless sufficient height is allowed for the spring. The springs must be made of wire of the right gauge and of suitable steel, and the cushion must be made by a competent workman. For bodies that we build we long since discovered that the finest long curled hair obtainable is the most economical in the long run.

I am sure you have all enjoyed sitting in a correctly proportioned Windsor chair which had no upholstery at all. To be truly comfortable, a cushion and back must not be too soft; it is one thing to sink into a very soft cushion when the car is standing on the showroom floor, but the question I want to ask is, How do you feel after riding 100 miles without arising?

Good style breaks down selling resistance, but comfort is the thing that keeps the car sold.

We give as much attention to a chauffeur's seat as we do to the owner's, for there is no one who will put the skids under an automobile more quickly than an uncomfortable chauffeur.

Very few lazy-backs give support in the right place, which we think is in the hollow of the back. Invariably you can feel the top and border wires used to construct the lazy-back.

Sound Insulation

Sound insulation is a very difficult problem. If I could solve it wholly or even partially, I am sure you would nominate me for the Hall of Fame. In my estimation the composite body, that is, one having a framework of ash covered with aluminum panels and castings and which has a leather top and leather side-quarters, is less susceptible to the noises that arise from the chassis. The fabric body is even better in this respect, but has many other objectionable features.

As the great majority of bodies are made almost entirely of steel, including the floor and steel pans, they magnify all of the sounds coming up from the chassis. In an all-steel body, vibrations of the chassis are magnified many times. If dashes, floors, seat pans and other body parts are to be made of steel, they should be of heavy material and reinforced to reduce vibration as much as possible. Floors of wood covered with heavily padded carpets help considerably. You undoubtedly know that the best insulation plan is to use a pad between the chassis

(Continued on Page 12)

NINETY-NINE OUT OF A HUNDRED CARS

SOLD BY A MAKER MAY BE FREE FROM ANNOYING BODY SQUEAKS

OR NOISES. YET LET ONE OFFEND IN THAT RESPECT AND THE REP-

UTATION OF THE ENTIRE LINE MAY SUFFER. BUDD ACHIEVES UN-

EQUALLED QUIETNESS IN THE ONE-PIECE BODY BY A SIMPLICITY

THAT LEAVES LITTLE OR NO CHANCE OF ERROR. ONLY EIGHT MAJOR

PARTS, FLASH WELDED INTO A JOINTLESS, ONE-PIECE BODY. WHERE

THERE ARE NO JOINTS, THERE CAN BE NO SQUEAKS, NO RATTLES.

BODIES BY BUDD

ORIGINATORS OF THE ALL-STEEL BODY. USED TO-DAY BY MANUFACTURERS IN THE UNITED STATES, GREAT BRITAIN, FRANCE, GERMANY

Delivering Oils and Gasoline Profitably

With summer and its accompanying increase in demand for automobile lubricants and fuels well on its way, the following survey on "Delivering Oils and Gasoline Profitably," which was compiled by the General Motors Truck Company, Pontiac, Mich., should be of particular interest. The full text of the report covering the facts brought out during the survey is appearing serially in Automotive Daily News. The report in pamphlet form is also available at all General Motors Truck Company dealers and distributorships.

THE fact that underload hauling increases the cost of delivery and reduces profits on the load delivered does *not* mean that it is either sound operating policy or profitable delivery practice to overload trucks. The majority of truck operators have learned, either by costly experience or by careful study of the facts, that overloading does not pay.

The facts about overloads are clear and unmistakable. Every truck is engineered to handle a definite amount of work. Axles, wheels, tires, springs, brakes, frame and other parts are designed for a definite job. A factor of safety is allowed in each of these parts to provide for emergencies. Every truck will carry a larger load than its rated capacity, because this factor of safety is present, but every pound of excess load reduces the margin of safety which engineers have built into the truck as a necessary safeguard against severe jolts, hard pulls and other strains common to everyday operation.

The operator who overloads, therefore, is like the spendthrift who lays away nothing for a rainy day. For overloads not only reduce the margin of safety, but also increase the violence of road jars and strains which the margin of safety is designed to withstand.

Accurate Weight Knowledge Needed

From the standpoint of profitable delivery, the vital importance of giving a truck the exact load it is engineered to carry calls for careful specification of body and load weights. Loose tonnage classifications are far from satisfactory. For example, one operator buys a two-ton truck and mounts a 600 gallon gasoline tank weighing 1,500 pounds. With cab and body mounted, the total weight of this equipment without the load may be 6,500 pounds. Another operator, however, buys the same chassis, mounts an ordinary platform stake body weighing only 700 pounds, and the total weight of the equipment without the load will be only 5,700 pounds. Now if each operator carries the rated capacity load of two tons, the question is: With 800 pounds difference in the total weight, which operator is carrying the correct load for which the truck was designed? If the tank truck operator is carrying the correct total weight, then the stake truck is underloaded 800 pounds—or, in other words, its true capacity is 4,800 pounds instead of two tons. On the other hand, if the stake truck operator is carrying the correct total load, the tank truck operator is overloaded 800 pounds and is in danger of harming his truck.

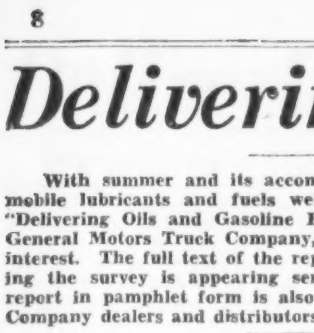
Tonnage classifications are a useful index for quick reference to the capacity of truck equipment, but the operator who wants maximum economy from the standpoint of loads carried will insist on the following steps in determining proper loads:

First—He will find out the total weight which the truck is designed to haul with the greatest economy.

Second—He will find the exact weight of the body, cab, fuel and water to be carried.

Third—He will determine his most profitable pay load by subtracting the total weight of the body, cab, and other extras from the total weight the truck is designed to carry.

(To Be Continued)



IMPROVED Tryon SPRING SHACKLES

Improved Tryon Spring Shackles embody important new features resulting in greater inbuilt strength, greater accuracy, increased bearing surfaces, improved lubrication, easier riding and longer life.

Manufacturers: **Write for full information and quotations.**

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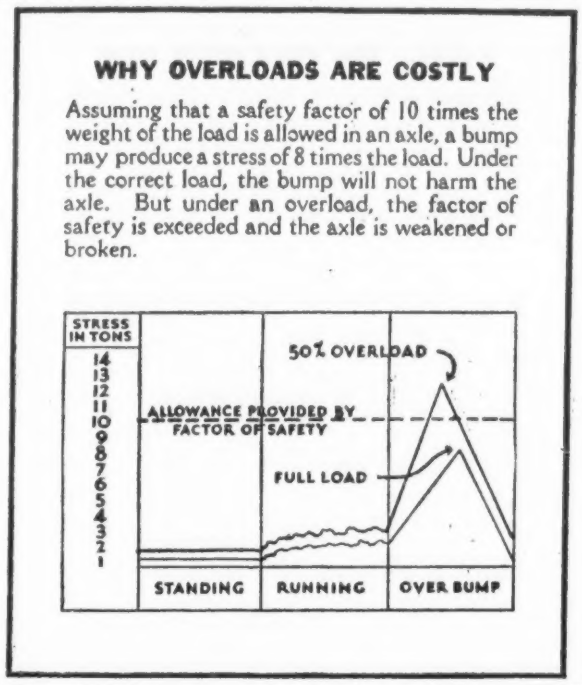

WHY OVERLOADS ARE COSTLY
Assuming that a safety factor of 10 times the weight of the load is allowed in an axle, a bump may produce a stress of 8 times the load. Under the correct load, the bump will not harm the axle. But under an overload, the factor of safety is exceeded and the axle is weakened or broken.
STRESS IN TONS
14
13
12
11
10
9
8
7
6
5
4
3
2
1
50% OVERLOAD
ALLOWANCE PROVIDED BY FACTOR OF SAFETY
FULL LOAD
STANDING
RUNNING
OVER BUMP

BUS, TAXI INTERESTS WIN INSURANCE RULING

Jersey City, N. J., June 15.—Vice-Chancellor Backes has denied the application of the State Department of Banking and Insurance to levy 100 per cent. assessments on policyholders in the Jersey Mutual Casualty Insurance Company.

Application was made by Pearce R. Franklin for the department on the theory that policyholders were responsible for the $379,000 deficit as members of the company to an amount equal to premiums paid.

A majority of Jersey Mutual policyholders are independent taxicab and bus owners in Newark, Jersey City and Hoboken. More than 400 Twentieth Century cab owners in Newark are policyholders.

The vice-chancellor ruled the department must proceed in a court of law to sue each policyholder from which it expects to collect the assessment. This means suits would have to be started against more than 1,200 cab and bus owners in north Jersey.

APPROVAL OF 13 BUS LINES IN THREE STATES ASKED

Erie, Pa., June 15.—The West Ridge Transportation Company, operating more than 1,000 miles of interstate bus lines in south-western New York, western Pennsylvania and north-eastern Ohio, with headquarters in Girard, Pa., has filed application with the public service commission for approval of thirteen interstate routes now in operation or contemplated.

These routes link the most important cities in the tri-state area, including Buffalo, Westfield, Salamanca, Jamestown, N. Y.; Ashtabula, Conneaut, Youngstown and Cleveland, O.; and Pittsburgh, Warren, Oil City, Erie, Meadville and Bradford, Pa.

HAYNES, OF FRANKLIN, NEW N. A. C. C. TREASURER

New York, June 15.—Frederick J. Haynes, vice-president and general manager of the H. H. Franklin Manufacturing Company, was elected treasurer of the National Automobile Chamber of Commerce at a meeting of the organization here Friday.

Mr. Haynes has served on the board of directors of this automobile manufacturing association since 1921 and is among the six men longest associated in this capacity. Since 1926 he has headed the patents committee, which has control of the cross-licensing arrangement among all makers, regarded as a model of trade co-operation. From his first connection with N. A. C. C. Mr. Haynes has also been a member of the taxation committee.

Mr. Haynes joined Franklin in December, returning after eighteen years to the organization through which he entered the automobile business and which he left in 1912 to become an executive of Dodge Brothers, which he later headed as president.

GREYHOUND TO ERECT $40,000 GEORGIA TERMINAL

Atlanta, Ga., June 15.—Approval of the Georgia Public Service Commission for the erection of a $40,000 bus terminal on the Candler site, at Carnegie Way and Spring Street, has been given the Southeastern Greyhound Lines, and immediate construction of the terminal is indicated by representatives of that concern.

The new terminal, with entrance from Spring Street and exit on Carnegie Way, will accommodate from twelve to fourteen buses at one time.

CHEVROLET DEMONSTRATION

Davenport, Ia., June 15. — The Blackhawk Chevrolet Company was host to numerous visitors at its salesrooms when one of a fleet of Ise-Vis white fleet cars was in the city. The open house was made possible through offering to show motorists a new testing device that indicates the amount of gas used.

CUMULATIVE NEW PASSENGER CAR

States	Auburn	Austin	Buick	Cadillac	Chevrolet	Chrysler	Cord	De Soto	De Vaux	Dodge	Durant	Essex	Ford	Franklin	Graham	Hudson	Hupmobile	La Salle	Lincoln
Arkansas	2		19		371	21		9		41	1	3	316		12	4		1	
Delaware	6		49	6	215	31		7	1	4	8	22	245	1	3	4		3	1
Idaho	11	1	25	1	313	18		15	4	29	7	8	252		9	5			
Illinois	445	16	684	117	4185	466	36	233	32	554	32	324	4557	21	110	119	175	98	49
Maryland	36	1	125	8	1382	97	1	33		61	13	82	1055	7	33	28	32	10	6
Minn.	81	5	239	11	2496	238	2	56	3	152	22	122	1852	1	68	53	102	12	6
Montana	2	2	39	5	332	39		18	2	26	11	19	327	1	6	21	4		1
N. Dakota	8		29	1	424	29		5		42	6	10	330		9	7	5		
Rho. Isl.	60	3	125	10	551	90		64		58	2	66	427	5	24	17	23	18	3
S. Carolina	5		43	1	699	50		31		30		22	714		2	8	11	3	
S. Dakota	6	5	31		401	42		18	2	54	5	12	340		7	5	9		
Utah	3		15	1	234	8	1	5	17	17	7	20	205	3	18	10	9	1	3
W. Va.	43	5	60	7	772	98	2	27	3	94	7	49	794		25	18	13	8	1
Wisconsin	148	7	329	29	2502	212	5	111	85	272	27	217	1844	2	85	90	55	24	6
D. of Col.	44	1	84	15	907	52	2	38		84	9	52	999	4	38	18	37	4	7
Totals	900	46	1896	212	15784	1491	49	670	149	1518	157	1028	14257	45	449	407	475	182	83
Ark., '30	1		27	5	671	35		9		45	9	19	902		8	6	3	5	2
Del., '30	9		49	6	225	28	1	9		9	18	14	374	2	2	11	6	11	1
Idaho, '30			48	1	455	22		26		52	23	16	581	2	18	16	3		
Ill., '30	124		1039	111	4749	655	43	354		582	92	458	9417	87	324	253	319	191	62
Md., 1930	6		204	10	1294	89	1	23		79	27	97	1725	7	63	37	47	20	5
Minn., '30	24		259	7	2832	262	4	82		212	118	224	4771	3	152	90	91	25	4
Mont., '30	3		42	2	399	37	1	21		44	20	49	578	7	15	28	13	1	
N. D., '30			41		651	32	2	15		34	18	19	827		15	4	2	1	
R. I., 1930	18		122	9	448	76	2	63		82	5	77	745	7	17	40	15	16	6
S. C., '30			54		743	37		12		23		22	864	1	10	19	9	2	
S. D. '30	3		30		586	44	2	21		45	25	34	684		5	15	18		
Utah, '30	7		44	3	316	30	1	19		27	34	39	596		26	19	5		1
W. Va., '30	9		108	3	1215	98	2	52		151	25	91	1688	6	61	36	17	11	
Wis., '30	34		638	37	3533	293	10	147		388	93	345	5456	32	243	171	100	44	13
D. C., '30	7		92	10	486	40		21		32	18	57	1069	1	45	23	21	9	3
Totals, '30	245	*	2797	204	18603	1778	69	874	*	1805	525	1561	30277	155	1004	758	679	336	97

*Not in production at that time.

Body Designers and Chassis Engineers Should Co-operate

Body Designer Wants Preliminary Outline of Chassis, Essential Measurements, Tolerances and Location Of Basic Units; Chassis Structural Details

By ROY F. ANDERSON

Sales engineer Murray Corporation of America, Detroit, Mich.

The following is a paper to be presented today at the summer meeting of the Society of Automotive Engineers, White Sulphur Springs, W. Va.:

The body designer referred to is the engineer or designer who is directly concerned about the appearance of the entire automobile, as well as being responsible for handsome, comfortable and substantial body designs. The rear-drive type of chassis is preferred too.

In plans for 1933 cars more attention should be given to the factors in chassis design that are most vital to the body designer, for each type of body model the line may include. Before proceeding with the scale and blackboard drawings, in which the initial lines of art are created, the body designer wants a preliminary outline of the chassis, showing all available tolerances for the wheelbase, the tread, the frame and cross-member heights, frame width, tire diameter and clearances, and the locations of the dash, steering wheel, radiator core and gasoline tank filler.

In the mind of the body designer, the body space in the wheelbase does not control the length of the body any more than it does the seating dimensions to provide comfort and the height of fully closed cars for four or more passengers. For example, a rear seat located ahead of the rear axle, or nearly so, permits comfort with less overall height than is required with the rear axle or frame members projecting high under the rear cushion. When the seat must be above the rear axle, the chassis frame should be wide enough, and the cross-members should be designed to allow the cushion to sit between the frame side members and around a housing directly above the center of the axle. The designer wants the chassis frame made wide enough to avoid very much overhang of the body, and to provide space for a recessed floor that will make adequate foot room for the rear seat passengers in closely coupled bodies having low roof lines. Cross-members should be located to avoid unnecessary obstructions for recessed floor.

Chassis Structural Details and Rigidity

After decisions are made regarding the initial chassis factors needed in connection with the body designs to be adopted, the body engineer is especially concerned about some chassis structural details that greatly affect the design of construction for the bodies. These are chiefly frame rigidity, anchor-bolt locations, battery locations, space available for tire-changing tools and the design of spare-tire supports.

Chassis-frame rigidity is essential for a quiet body, and for the operation of the doors without strenuous effort when the car is parked where the wheels are not on a level plane. A well-constructed body will withstand all the wear and strain it may get in serving the function for which it is designed, but it should not have to resist a sagging or twisting chassis frame. Many complaints of body trouble have been found to be due to such a condition in the chassis.

A frame that twists ¼ inch in 90 inches of length causes a 7-16-inch vertical motion at the lock side of the front and rear doors of a sedan when the center pillar is the lock pillar for both doors and the doors open enough to disengage the dovetails. In the test from which these figures were taken a 5-16-inch movement was noted in the front doors, and the remaining ⅛ inch was in the rear door. The body designer wants chassis-frame flexibility reduced to negligible fractions, and to avoid excessive body weights, cost and service expense. He is interested in avoiding all unnecessary weight, with due consideration for costs of high-priced materials, but he must rely on the chassis engineer for a dependable foundation on which to build.

A frame design in which the flexibility is kept ahead of the cowl and back of the rear axle, would be best for the body. Another advantage would be to provide space for a body cross-member between the side sills at the pillars directly ahead of the front doors, where the strain in the body is greatest, but where the available means for support is least.

Anchor-Bolt and Other Locations

Soon after the body drafts are started, the anchor-bolt locations become a problem for which the body designer needs the chassis engineer's full co-operation, as well as for the area of bearing on the chassis at these points. The body designer wants a bolt close to the base of each pillar at door openings, and additional ones in the door opening when the door is extra wide. The area of bearing should be sufficient to assure rigidity in the relation of the body sills to the chassis frame, and there is a need for improvement. Comfort is effected by convenient access to the car's battery and tire-changing tools. Such access should not require removal of a cushion. The body engineer wants more consideration given to this accessibility factor in the chassis design.

Car ventilation becomes chiefly a cooling problem when heat from the engine, exhaust pipe or muffler penetrates the body. The chassis design should be worked out so that provision for proper ventilation may be designed into the body without having to contend with heat from such parts.

With the spare tires located on the side of the car, the supporting parts can safely be anchored to the front of the body if the connections are not rigid. A leather strap, or flexible joint in the design of the metal connections will avoid strains too severe for the front assembly of a body.

When the 1933 cars are released to production, the body designers will be glad to have been co-operating with the chassis engineers to make bodies finer as a unit, as well as in body details.

LINK-BELT CONVEYOR CHAIN FEATURES FLEXIBILITY

A conveyor chain, the No. 77, for light conveyor work is now being made by the Link-Belt Company, Chicago, Ill. The particular feature of the chain is its ability to curve sideways around corners and "S" curves. Under full loads it will travel in a horizontal plane around curves 90 to 180 deg., with radii as small as 24 in. and on sprockets as small as 7½ in. pitch diam.

FAIR QUARTER OUTLOOK FOR STEEL OPERATIONS IN YOUNGSTOWN SECTOR

(Continued from Page 1)

period beginning July 1, normally the poorest quarter of the year.

The report that the Ford Motor Company is expecting to introduce an eight-cylinder car to the market shortly and is buying steel for such a car from Mahoning Valley makers is being generally denied here. Sheet mill schedules give no hint that special steel for such a car is being rolled, and some doubt is expressed whether Ford would withdraw emphasis from his profitable low-priced car business by the introduction of an eight-cylinder car at this time.

Demands for some steel products have been so weak during the last three or four months that no seasonal trend downward is discernible. Finishing mills of the district are averaging 44 per cent., as last week.

Large companies of the district report no significant change in operations. Republic Steel Corporation production is again on a 45 per cent. basis with a recent gain in open hearth steel output at Youngstown being maintained. The company's tin mills at Warren are operating at a fair rate and operations for the corporation are higher in this district than for the industry as a whole.

Youngstown Sheet & Tube Company operations in the valley are holding near the 33 per cent. level with the company's seamless pipe mills more active than a week ago. Carnegie Steel Company operations in the district are at 45 per cent. while Sharon Steel Hoop Company operations are at 50 per cent. Empire Steel Corporation's sheet plants in the district continue idle.

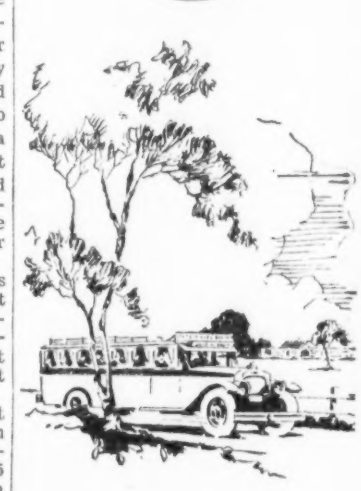
Mahoning Valley Steel Company resumed operations at its Niles sheet plant after several days idleness, lifting the total of sheet units under power at Niles to 14 out of 54.

One-third of the 33 blast furnaces in the district are melting, with 11 active against 12 two weeks ago. This stack, however, is a merchant furnace, and steel works blast furnaces are operating unchanged, indicating that little variation in the character of the current steel market is considered probable in the near future.

REGISTRATION STATISTICS, MAY, 1931

States	Marmon	Nash	Oakland	Oldsmobile	Packard	Peerless	Pierce-Arrow	Plymouth	Pontiac	Reo	Studebaker	Stutz	Viking	Whippet	Willys	Willys-Knight	Miscellaneous	Totals
Arkansas		8		8	2			12	19	3	9			4	5		1	871
Delaware		3	7	13	8			7	40	1	6				11	4		706
Idaho		16	2	9	2			26	10	4	19			1	14	1		802
Illinois	28	331	118	621	124	34	25	178	878	41	366	7		4	269	42	10	15,329
Maryland	4	50	26	54	22	15	8	59	216	6	70	1	1	1	67	14		3,624
Minn.	3	83	35	223	26		9	226	340	12	130		1	9	238	25	1	6,882
Montana	4	14	8	20			1	32	47	4	23			3	23	3		1,037
N. Dakota	4	15	4	15				37	62		24		1	15	51	4		1,137
Rho. Isl.	2	38	17	25	11	4	15	34	112	14	41	1			22	4	1	1,887
S. Carolina		6	2	18	3		1	15	48	1	12				6			1,731
S. Dakota		13	6	56	3			36	39	1	21		1	8	28	2		1,151
Utah	2	22	4	15	3		1	6	24	2	11				4	4		675
W. Va.	4	36	19	50	13			79	153	5	31			2	113	11		2,542
Wisconsin	16	203	63	235	24	4	12	178	451	19	196		4	17	214	21	4	7,711
D. of Col.	9	41	47	82	39	7	8	27	157	1	62				26	6	11	2,918
Totals	76	879	358	1444	280	64	80	952	2596	114	1021	9	8	64	1091	141	28	49003
Ark., '30	1	13	7	7	3		2	47	21		15			14	2	4		1,883
Del., '30		6	8	12	16		2	27	32		12			6	10	3	2	911
Idaho, '30	3	21	17	13	4			34	25	2	18	2	3	13	13			1,431
Ill., '30	82	513	193	565	284	26	46	532	692	67	472	12	31	126	320	131	94	23,046
Md., 1930	4	64	39	59	40	5	11	61	128	7	99		3	29	54	17	7	4,361
Minn., '30	21	97	96	177	51	3	12	407	395	21	198		5	139	214	58	10	11,064
Mont., '30	9	26	14	18	2	2	1	46	36	6	40		3	17	26	12	1	1,519
N. D., '30	18	31	20	30	2			56	63	2	34		1	30	41	6	3	1,998
R. I., 1930	6	40	22	48	32	12	14	66	86	24	22		1	4	35	17	6	2,183
S. C., '30	6	10	4	16	11			27	23	2	11		1	6	4			1,917
S. D. '30	6	26	14	71	5		1	60	39	9	33		4	31	42	9		1,862
Utah, '30	1	16	12	18	7			24	26	4	20			3	2			1,300
W. Va., '30	18	59	32	61	22	1	2	110	121	13	54	1	2	68	87	15		4,239
Wis., '30	46	436	158	330	70	23	25	473	558	33	303		14	123	263	44	17	14,493
D. C., '30	12	24	24	45	31	10	9	47	60	5	44	1	2	2	6	7	11	2,274
Totals, '30	233	1382	660	1470	580	82	125	2017	2305	195	1375	16	70	611	1119	323	151	74,481

CONTINENTAL MOTORS
Powering a Nation
AMERICA'S STANDARD



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The record of Continental's contributions to the power requirements of hundreds of manufacturers and thousands of consumers, is the result of the co-ordination of men and facilities which have worked toward a common goal. These men and these facilities work now towards new developments—new goals.

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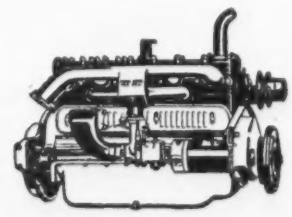

Continental Engines

Production--Engineering--Factory

Trailers as a Means of Economical Transportation

By G. W. CHAMBERLIN

Vice-President and Director of Sales, Fruehauf Trailer Co., Detroit, Mich.

An era of economy has settled upon every industry today.

Executives have sharpened their pencils as never before and have sharply scrutinized details all along the production line with the constant aim of accomplishing greater manufacturing efficiency at a lower unit cost. They have achieved some remarkable economies in this respect.

Far too many of these executives, however, have been content to carry their analysis of unit costs only as far as the shipping room door and have entirely ignored a field which is surprisingly rich in potential economies. This is the field of distribution . . . the transportation item which figures prominently in the cost of every article or commodity on the market today.

One amazing stride has followed another in the development of this important science of commercial transportation, but probably the development which contains the most far-reaching of all possibilities is the one which is opening up at the present time. I refer to the perfection of the gasoline-powered motor truck equipped with semi-trailer or four-wheel trailer.

The trailer idea is easy to understand. A truck can pull more than it can carry. The railway train is a favorite example of the principle. Every one of us has, at some time or other, marveled at the number of box cars which are propelled by one valiantly puffing locomotive, and we have made rough estimates as to the tremendous weight represented by those cars. Now imagine—or try to imagine—all those loaded freight cars piled up on the back of that locomotive!

The picture is equally true of the motor truck. One chassis and one rear axle could never stand up under a load which is safely and efficiently spread over two axles by means of the trailer principle. The owner of a one-ton or one-and-a-half-ton tractor truck with a three-ton semi-trailer, for example, can efficiently handle loads up to five tons. And the substantial economies resulting from this modern trailer unit will surprise many an executive who is otherwise well-informed about his cost sheets.

Consider for a minute the matter of initial investment. The one-ton or one-and-a-half-ton tractor truck equipped with three-ton trailer requires an initial investment of $1,890. The average cost of standard makes of the straight three-ton truck required to handle the same load is $3,700.

Starting, then, with an initial saving of more than $1,800, the owner of this modern trailer unit will roll up corresponding savings during the entire lifetime of his unit. Fixed expenses, such as interest, licenses and insurance, operating or running expenses and depreciation, all of these contribute a dollars-and-cents saving to this owner. In matter of depreciation, for example, the straight or tractor truck can be depreciated over an expectant life of 100,000 miles, which ordinarily covers three or four years' operation, while the trailers should be depreciated over an expectant life of 250,000 miles, or eight to ten years' operation.

Some of the most striking economies of trailer operation, however, are to be found in their actual performance and not in mere figures. The oil company, the grocery chain, the creamery or the bottler who operates a trailer unit which can make three times the number or volume of visits before returning to the supply house for reloading has obvious economies at his command. The shuttle system, whereby one trailer is being loaded, a second trailer is in transit behind the truck and a third is being unloaded at destination, is another example of such economy, which reduces to a minimum the idle time of the power truck. Trucking companies have developed various angles of this system with remarkable success.

In fact, one industry after another has discovered that trailer units offer new and greater possibilities for cutting transportation costs and increasing the efficiency of distribution. The elasticity of trailer operation allows them to adopt trailer units which fit perfectly into the requirements and conditions of each individual business.

The general haulers are an especially outstanding example. These carriers are transportation specialists. They have nothing to sell but their services in hauling goods. Their entire success and livelihood is dependent on their ability to haul efficiently at lowest ton-mile costs. And these companies, from the largest to the smallest, have turned to the trailer for economical transportation. More than 4,000 trailers are now employed by leading firms in every section of the country, whose sole business is the economical hauling of commodities over both long and short distances.

It should be noted in concluding this brief view of possibilities in this field that the modern trailer is by no means a mere cart tied on to the end of a motor truck. Fruehauf, the oldest manufacturer of trailers, has been conscientiously studying the problems of ton-miles-at-lowest-cost for more than sixteen years. All the accumulated knowledge and experience gained in other branches of motorized transportation have gone into the manufacture of these trailers. Each year Fruehauf has perfected models of a superior design and stamina, analyzing and solving every possible problem of weight distribution, axle loads, length, speed and brakes.

Fruehauf, during these years of pioneering, development and perfection in the commercial car field, has given new life and meaning to the ideal of "enginered transportation." All those industrial firms which are striving today for new economies and new efficiency would do well themselves to examine this fertile field—"engineered transportation."

Lists of Fleet Owners

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1000 Owning 100 or More
17000 Owning 10 or More
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We quote on a separate list for any large city.

Let YOUR salesmen spend THEIR time talking to prospects, instead of looking for prospects to talk to.

FLEET OWNER LIST CO.
1817 Broadway, New York City

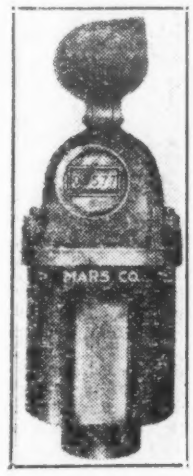
ELECTRACRAFT KUM-A-PART GEAR SHIFT LEVER KNOB

A new hollow gear shift lever knob, the Kum-A-Part, has been placed on the market by the Electracraft Corporation, Boston, Mass. It replaces the original equipment without adapters. The price is 75 cents.

AC INTRODUCES NEW MARINE TYPE SPARK PLUG

A new marine spark plug, known as G-3, has been introduced by AC Spark Plug Company for all high-speed outboards when used for racing.

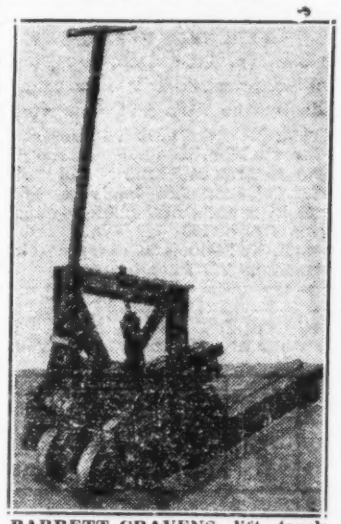
MARS METER FOR 10-GAL FUEL PUMP



MARS gasoline meter for ten-gallon visible pumps

A meter for ten-gallon visible gasoline pumps has been perfected by the Mars Company, Aurora, Ill. The fuel must pass through the the meter, as no by-pass is provided. It is quickly installed by connecting between the ten-gallon visible bowl and the hose. It is adjustable by means of a compensator. Weight is eleven pounds.

LIFT TRUCK DESIGNED TO FACILITATE TIN-PLATE HANDLING



BARRETT-CRAVENS lift truck for handling tin plate

A new lift truck designed for handling tin plate has been announced by Barrett-Cravens Company, Chicago, Ill. The truck is of the fork type, built 3½ inches high to go under stacks of tin plate which are shipped on 2 x 4's.

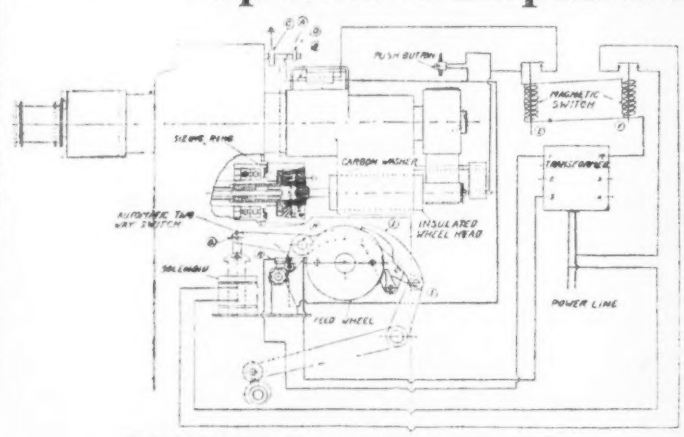
The lift truck eliminates the piling operations in unloading from freight cars and in placing in storage.

ROSS MAKES VALVES PNEUMATIC CONTROL

Foot and hand controlled operating valves for pneumatic control have been developed by the Ross Operating Valve Company, Detroit, Mich. The foot-operated valve is made in two styles, models D. T. and S. T. The model D. T. is made in three sizes, ⅜, ½ and ¾ inch pipe sizes, and is mounted in brackets. Foot treadles are cast steel, and all pins, levers and rockers are hardened. The model S. T. is made in five sizes, ⅜, ½, ¾, 1 and 1¼ inches. It is offered for double-acting service.

The hand-operated valve is made in five sizes, ⅜, ½, ¾, and 1¼ inches, for single and double acting cylinders and in locking or non-locking types.

Bryant Sizing Device Operation Explained



DIAGRAMATIC sketch of Bryant sizing device

Following is a description of the operation of the new sizing device introduced by the Bryant Chucking Grinder Company, Springfield, Vt., and recently announced in the Automotive Daily News.

When electrical contact is made between the carbon washer and sizing ring, spring "A" is in contact with collar "C" and the sizing circuit is closed. Starting at terminal "R" of the transformer, current flows through the coils of magnetic switches "E" and "F," to the wheel spindle brush, through the spindle to the carbon washer; thence to the sizing ring; through the bed to collar "C," to spring "A," to the leaf of the automatic two-way switch, and back to terminals 1 or 3 of the transformer, according to the setting of the switch. These lines are shown as connected to terminals 1 and 3, but would be connected to other terminals of the transformer if other voltages were desired.

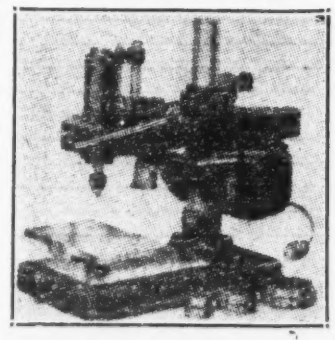
Magnetic switch "E" and contact "B" closes a by-pass around the sizing ring and holds both switches closed after the sizing circuit has been opened at the sizing ring or cellar "C." This assures time enough for the solenoid indicated on print I-603 to act. This by-pass or holding circuit remains closed until the slide is moved to the right beyond the grinding stroke far enough to cause collar "D" to depress spring "A" and break the circuit at "B." A push button indicated on this print also by-passes the sizing ring and permits the operator to trip the device at will.

Magnetic switch "F," having been closed by the action of the sizing circuit, is held closed by the holding circuit through switch "E," as outlined in the preceding paragraph.

The closing magnetic switch "F" energizes the solenoid which pulls down the left end of lever "G," which is pivoted on stud "H." This action causes the feed pawl "I" to be withdrawn from the feed wheel and the wheel itself to be turned backward by pawl "J." The feed is thus backed off a few thousandths of an inch and grinding stops.

Lever "G" is held in the backed-off position by a spring latch not shown, and there is no motion imparted to the hand wheel until the operator deliberately turns it to the right to resume grinding after dressing or inserting a new piece of work. The action of pawl "J" then causes the lever "G" to return to the position shown by print I-603, which permits feed pawl "I" to resume feeding. At this time the automatic two-way switch is reversed by pawl "K" carried by lever "G," changing the voltage from roughing to finishing or vice versa. If the nature of the work is such that only one cut is necessary the lines shown connected to transformer terminals 1 and 3 are both connected to one terminal and the voltage made constant.

MAXIMUS BENCH DRILL FOR LIGHT WORK



MAXIMUM A. M. bench drill

The "Maximus" A. M., a sensitive bench type drilling machine for small drilling and other delicate vertical operations, is now offered by Adolph Muehlmatt, Cincinnati, O.

By the application of a universal slide rest the Maximus can be converted into a universal vertical milling machine.

Four ranges of spindle speeds are obtainable by means of four ranges of motor and spindle pulleys available. Three of these drives are standard and the fourth is special. Speeds up to 3,500 r. p. m. can be obtained as standard and up to 4,375 r. p. m. as special.

Holes can be drilled to the center of a 16-inch circle. The normal vertical capacity of 10 inches between the base and the chuck may be increased to meet special requirements. Vertical adjustment of 7 inches is imparted to the drilling unit by means of a worm, pinion and rack mechanism. A round table 5½ inches in diameter and a 10x6-inch rectangular table, fitted over the round table, are included in the regular equipment.

The motor is mounted on a sliding bracket having a travel of 2 inches Drive is by means of a ⅝-inch endless flat leather belt. Drilling capacity, ¼ inch.

HESTON MAKES NEW BENCH BANDSAW

A small motor-driven bench band saw is introduced by Heston & Anderson, Fairfield, Ia. It clears 12 inches under the guide and 13¾ inches between blade and frame. The frame is of one-piece tubular cored construction. Rubber-covered driving wheels 14 inches in diameter, with a 1-inch face, are used. The upper wheel has a spring arrangement for maintaining proper blade tension.

A graduated plate permits tilting the table 45 degrees to the right and 5 degrees to the left. It measures 14 by 14 and has a 5½ inch by 8 inch side table attached. Two 8½-foot blades are furnished. It is driven by a half-horsepower induction-repulsion type motor. Net weight is 200 pounds.

Although designed for bench mounting, a table can be furnished for floor use.

J. H. Moore Predicts Return To Normalcy by Mid 1932

(Continued from Page 1)

making this prediction is the report I have received from the cotton textile industry. Our bank has a large number of accounts with textile manufacturers. Their reports show that orders, large and small, are coming in from all parts of the country. That industry, by the way, was the first to indicate revival following the depression in 1921.

"Another reason for optimism is the fact that the large research laboratories of the United States have not been closed during this depression, as they were in those of the past. There are inventions on their shelves now that will have a profound effect on the human race. Television is with us. Within three years, radio engineers have informed me, you will be able to tune in your radios and see your entertainers as well as hear them.

"Science has made greater progress during the last ten years than in any 100 years before. Constantly, the scientists create new industries. Science is a dynamic force which will not permit us to remain much longer in a trough of despondency.

"There are a number of things that must be corrected, however, before the depression can be ended in all lines of endeavor. There is an overproduction of wheat that must be eliminated. The war forced Russia out of production and this gave the United States and Argentina a greater opportunity than ever before to enter intensive production of this cereal. The war is over. Russia is producing wheat again, and it is impossible to keep Russia down. The sooner we face that fact, the better off we shall be.

"We must readjust the world's supply of cotton to its demand. Land values, rural and urban, must be readjusted. This also applies to the cattle market.

"Then we have also the domestic political problem. Those who see the stock market react favorably during the next few months should not act too hastily. Congress will convene shortly and it is likely that it will express some opinions that will send shivers and chills down the spines of business men.

"Altogether, considering commercial and industrial conditions, considering the gold reserve, which is the largest in the history of the United States; considering the liquidity of the larger banks, considering the fact that this depression has lasted two years, I believe that this period is approaching its culmination."

Mr. Moore criticized sharply the last tariff increase and said that he was depressed by its effect on American industry.

MARMON'S NEW PLAN WILL PRODUCE PROFIT

Indianapolis, June 15.—Reorganizing the operating plans and reduction of overhead expenses of the Marmon Motor Car Company is expected to produce an operating profit, even at the present reduced rate of output, advices from the company indicate.

Production for the remainder of 1931 is to be on a new schedule worked out by the management and is expected to result in satisfactory earnings for the company.

The new schedule went into effect on May 1 and sales for that month were more than 450 cars, exceeding the estimate for the period. Current operators indicate that June sales will also exceed estimates.

EXPANDS TERRITORY

Spokane, Wash., June 15.—Roy Hotchkiss, manager of Auburn Sales and Service, Inc., announces expansion of his territory so that it now includes all of eastern Washington, northern Idaho and part of western Montana. The additional territory will necessitate putting on a wholesale traveler.

Classified Advertising

Classified Rates 5c Per Word

AN EXPERIENCED EXECUTIVE

Wholesale and retail automobile experience, would like to get with some live-wire dealer of sufficient size and financial ability to permit of some scope. Experience includes factory branch manager so would consider a factory connection. Box 283, Automotive Daily News, 350 Hudson St., New York city.

FOR SALE

De Soto Double Face Electric Sign including flasher. Sign 6½ feet wide and 12 feet long, in splendid condition; used about 2 years. Sign originally cost $750. Will consider any offer. Drawings furnished on request. Jarman Motors, Inc., 301 W. 25th St., Baltimore, Md.

TRUCK EXECUTIVE of wide experience in merchandising, branch management and wholesale distribution desires connection with truck or car manufacturer. Experienced in East, South and Middle West territories. Box 284, Automotive Daily News, 350 Hudson St., New York city.

N. J. TRUCK MEN WILL ASK LEGISLATURE FOR FULL RECIPROCITY LAW

(Continued from Page 1)

will be introduced again, with the support of Motor Vehicle Commissioner Hoffman.

"During the closing weeks of its recent session the Pennsylvania Legislature enacted a full reciprocity law," Alfred D. Way, secretary of the Motor Truck Club of New Jersey, said yesterday. "We want New Jersey to do the same thing.

"In fact, some such action is imperative, if the interests of truckmen and farmers of our state are to be defended. Despite all the efforts of Motor Vehicle Commissioner Hoffman, police in New York continue to harass our truck drivers by giving them tickets for improper tags, regardless of whether they have been in that city the fifteen times allowed under the present agreement.

"Many of our truck owners have been forced to obtain New York plates, the money so spent being a sheer waste, so far as our citizens were concerned. Of course our state under the existing laws receives revenues from drivers of vehicles in other states who use our roads.

"But a survey made by Commissioner Hoffman shows that New Jersey gets only $290,000 from this source, whereas our residents pay out nearly $500,000 to other states. As a matter of fact, action on the MacAllister bill was held over in the last legislative session until Commissioner Hoffman could finish his investigation into this phase of the problem.

"Now that his findings are known, there are no further reasons for delay in giving relief to the 500 or more truckmen and farmers of our state" Mr. Way added.

Trenton, N. J., June 15.—The necessity for passage of an unlimited reciprocity act for interstate trucks at the special session of the Legislature, proposed for the week of June 22, arises from the certainty of open warfare by New York motor vehicle authorities unless such action is taken.

This was declared at the organization meeting Friday of the House committee for revision of the motor vehicle law. The committee decided the present situation on interstate truck traffic constituted an emergency that deserved consideration at the special session.

The plan of the committee is to seek passage for an act providing unlimited reciprocity with other states on interstate truck traffic. The act would be effective for the remainder of the year to prevent any retaliatory measures by New York. It would give the committee time to study the subject with a view of presenting a permanent solution to the 1932 Legislature.

DE SOTO PLANS DETROIT AREA DEALERS' MEETING

Detroit, June 15.—De Soto dealers of the Detroit district will attend an all-day conference with factory officials here Thursday.

The meeting will be presided over by L. G. Peed, general sales manager; R. E. Newland and J. F. Boyd, assistant sales managers, and L. T. Hannah, Detroit district manager.

More than 100 dealers will be in attendance. They will represent the larger cities in the Detroit district, including the metropolitan area: Pontiac, Port Huron, Toledo, Ann Arbor, Jackson, Battle Creek, Kalamazoo, Lansing, Grand Rapids, Muskegon, Saginaw, Bay City, Flint, Alpena, Cheboygan and Sault Ste. Marie.

A NATION-WIDE NETWORK OF SERVICE STATIONS

From coast to coast, from the Great Lakes to the Gulf of Mexico, in metropolitan centers, and in tiny cross-roads hamlets, are to be found the signs of official Auto-Lite Service Stations. The owner of the Auto-Lite equipped car—more than half the automobiles built today are Auto-Lite equipped—never finds himself far from a place where the electrical system may be serviced.

This is one of the reasons for the popularity of Auto-Lite electrical equipment with car owners. Another reason is Auto-Lite's well-known policy of building only the finest quality and workmanship into starting, lighting and ignition systems. Car owners naturally prefer, and insist upon, Auto-Lite dependability.

THE ELECTRIC AUTO-LITE COMPANY, TOLEDO, OHIO

Auto-Lite

Starting, Lighting & Ignition

The Streamlined Car

(Continued from Page 3)

reference to adaptability to doors, axles, wheels and engine.

Then began a series of remarkable discoveries in the matter of adaptability of design. Not only was our full streamlined body adapted to fast and economical travel through the air, but special advantages which developed in adapting its other essential features and units were as unexpected as they were inspiring. The following are noteworthy:

1. The body proper was immediately adaptable to unit construction, simulating through-bridge construction and strength, and eliminating need for the conventional chassis frame.

2. With proper streamlining and with the bottom of the body modified to more nearly parallel the road surface, there was ample room behind the rear seats for the engine, eliminating its usual noise, vibration, heat and odors.

3. In front of the front seat is ample space for steering installation and for storage space comparable with that in the ordinary roadster deck.

4. Engine, transmission, rear axle and rear springs may be incorporated in one unit and assembled direct to the body frame on the final assembly line.

5. Front axle, front springs and steering may be incorporated in one unit, likewise to be assembled direct to the body frame on the final assembly line.

6. Seats may be swung between the axles and as low as desired, due to absence of a propeller shaft.

7. Modification of the front full streamlining may be made for clear vision without materially sacrificing in aerodynamic efficiency. It is the maintenance of approximately full streamlined form at the rear that is of great importance.

8. Fenders, running boards and outside headlamps may be streamlined against wind resistance or eliminated as such by incorporating in the main body structure.

9. General outline, including main streamlining, windows, moldings and color schemes, are adaptable to unlimited variation.

Beautiful in line and symmetry and functionally correct, the possibilities of improved over-all gracefulness as compared with present-day automobile shapes is quickly apparent.

Although a completely symmetrical streamlined form would not be possible, or, indeed, desirable, aerodynamically for a car running close above a roadbed, our theory was that a full streamlined automobile could be designed that would possess striking beauty and attractiveness of line and contour and at the same time show remarkable decrease in wind resistance and, therefore, remarkable improvement in fuel consumption. Our theory went further, for we also believed that, by rearrangement and reconstruction of the chassis units, notably by mounting the engine at the rear and swinging the seats low between the axles, great improvement could be provided in visibility and in general riding comfort.

The interferences and swirling indicated by airflow tests at both front and rear of the standard car cause frontal resistance and rear-end drag which can, in the tear-drop car, be largely converted into skin friction of a tremendously lower order of resistance.

Fig. 4. Standard sedan and "tear-drop" car of same wheel base and

Fig. 2 shows our test model of a full-streamlined rear-engined tear-drop car. Its appearance is at first strange, even startling, perhaps. But, since there is nothing harsh or incongruous about the design, and since, fundamentally, we know that there is reason and logic back of it all, it grows upon us and we learn to like it.

These models were constructed one-quarter full automobile size, complete and exact in every detail, and were painted in attractive color combinations. They were displayed and their advantages explained to each of thirty-eight different people at two or more different times. This number included chassis engineers, body designers, airplane experts, salesmen, general executives and the ordinary automobile using public. As a result all except four expressed approval.

There is a crying need for improvement in efficiency, economy and attractiveness of the automobile. We have general knowledge from which we can readily develop specific designs that will cut the gasoline consumption in half, and at the same time give more beautiful appearance and increased riding comfort.

That the public is interested and has been for a long time cannot be disputed. As long ago as 1913, the Scientific American published an article deploring the handicaps that prevented the automobile engineer from making "radical innovations" when desirable, saying: "The conservatism of the majority of the human race resents upheavals of any kind, preferring a gradual elimination of the undesirable. The change from carriage body to automobile body therefore had to be made slowly, and at the present time we have about arrived at the

(Continued on Page 14)

Comfort in Cars

(Continued from Page 7)

and the body. It is the responsibility of the chassis engineer to do all in his power to build power plants having the least possible vibration.

Ventilation can be secured through a combination dome light and ventilator in the roof, and also by using small glass panels 3 or 4 inches wide on the outside of the upper part of the door frame.

Vanity cases are fast passing out of the picture, I believe. We supply ground-glass mirrors in one side of the arm rest and an ash try and cigar lighter in the other rest.

We have been using an English Neutralite glass for outside visors for more than ten years, and have never found anything to take its place. I am not very much in favor of the heavy glass framed visors inside of bodies, because they are very dangerous in case of an accident.

The old saying that "a prophet is not without honor save in his own country" does not bear directly upon my subject, but I make the prediction, probably because I hope that some day it will be fulfilled, that the automobile of the future will become one unit rather than two. Undoubtless it will be built as two units, one being the body and the other the chassis, but I am sure that these two units will be so much in harmony that they will appear as one. I have often thought of this when studying automobiles on the road, especially those having light-colored bodies and black chassis and fenders.

Coach Building Reviving as an Art

Ours is a great industry and I am proud to be associated with it. Let us stop calling it the automobile "game." Let us not be forever trying to get something out of it, but to put something of ourselves into it. Over the portals of the transportation building at the Pan-American Exposition was inscribed this quotation by Macauley: "Excepting the alphabet and printing press, those inventions which abridge distance have done the most for civilization."

What a compliment that is to our industry, for surely no invention has done more to abridge distance or to bring people together than has the automobile.

For hundreds of years, coach building was regarded in European civilization as one of the highest forms of commercial art. The coach was an outward indication of wealth and aristocracy, and the most skillful artists of the day were engaged in the industry, sometimes spending several years in building a single coach. Often the lines of these coaches were very beautiful. There are coaches in Holland on the panels of which Rembrandt himself painted pictures. Up to the middle of the nineteenth century, coach building flourished greatly. Then, with the coming of the steam railroads, modes of travel changed and its decadence began.

Again, only a few years ago, another revolution in transportation occurred with the coming of this trackless vehicle of great speed called the automobile. This was more in the nature of a direct improvement upon the coach of former days. Manufacturers and owners are turning their attention more and more to the body of the automobile. The desire for a beauty of line and finish and for the expression of one's own personal taste is causing a revival of coach building in a new form. The buyers, both men and women of today, are just as keen for individuality and distinctive appearance in their automobiles as the old aristocrat was proud of the exclusive features of his family coach.

Suppose your guild and mine resolve here and now that the Brewsters, the Kimballs, the Andrew F. Johnsons, the Kellners, the Labourdettes, the Barkers and all those who have made the glorious history of coach building shall not have labored in vain. Let us resolve to make an earnest, painstaking effort to do our part toward bringing about a permanent revival of this century's old art of coach building.

What's Going to Happen on June 17?

The Wednesday session of the S. A. E. will take place. It also may be the day on which a state releases its passenger car or truck registrations, it may be the day a new car is announced or a new machine introduced. Whatever of importance happens, Automotive Daily News, will pick up the story from the ticker, or one of our own reporters will get the story, or one of our 260 correspondents will cover for us. It is printed that SAME DAY. There is no faster, finer service.

Big executives have come to depend on this quick and easy-to-read news medium with the result it has reader interest that is very high.

Advertisers desiring to reach the industry, get maximum visibility for copy of any size.

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G. M. May Dealer Shipments Outside U. S. Top Year Ago

NEW YORK, June 15.—General Motors in May shipped nearly 50 per cent. more cars and trucks to its dealers in the markets outside the United States than in the corresponding month of last year, although there was a decline from April.

Sales by General Motors manufacturing divisions to dealers in the foreign markets last month totaled 16,952, as compared with 11,314 in May of last year, the increase being just short of 50 per cent., and comparing with 21,623 in April, a falling off of 21 per cent.

May was the sixth consecutive month in which export shipments of General Motors exceeded those of the corresponding period of the preceding year. Also, the increase in May was the sharpest to be registered this year.

For the first five months of 1931, export sales of the corporation amounted to 87,125, as compared with 74,797 in the corresponding period of last year, an increase of 16 per cent.

The sudden about-face in General Motors export sales of cars and trucks came last December, after a decline ranging over many months. In December the gain over the corresponding month of 1929 was 212 per cent. In January, the upturn continued but at a lower rate, the gain over the first month of 1930 amounting to 5 per cent. In February, there was an increase of 3.4 per cent., while in March, the upturn amounted to 13.5 per cent. The April increase was 18 per cent.

Following are the figures for the last seventeen months, as compared with the corresponding periods of the preceding year. These figures were obtained by subtracting the General Motors shipments to dealers in the United States from total shipments to dealers, including Canadian and overseas shipments, as provided by the corporation in its monthly reports:

	1930	1929
January	12,051	32,139
February	15,292	33,926
March	17,849	43,881
April	18,296	51,084
May	11,314	44,404
June	9,845	37,050
July	9,260	32,317
August	9,470	20,834
September	8,891	19,263
October	5,239	23.545
November	9,102	21,232
December	11,756	3,740
Year	138,365	363,415
	1931	1930
January	12,668	12,051
February	15,630	15,292
March	20,252	17,849
April	21,623	18,296
May	16,952	11,314
Totals	87,125	74,797

GOOD START FOR SALES CONTEST ON CHRYSLERS

Newark, N. J., June 15.—The June sales contest begun the first of the month by the De Cozen Motor Company, Chrysler distributor, according to Albert De Cozen, sales manager, has got well under way and is giving every indication of having the quota reached by every member of the sales force by June 30, if the results shown thus far are any indication of what to expect for the remaining three weeks.

In connection with the large contest board, a smaller bulletin board is being used on which a different cartoon is drawn each day, depicting some phase of the contest or a caricature of the various members of the sales force. The men in the force to date are Riordan, Meycre, Waskie and Deehan.

Verbatim Reports on Truck Rating Session of S. A. E.

(Continued from Page 4)

great contribution to the problem that we have before us.

"I believe the proper body to establish such ratings is the S. A. E. I would, therefore, propose for discussion that a system of rating be used in which the tire size is the limiting factor of the weight to be carried unless the manufacturer chooses to rate his vehicle less than the amount allowed by the tire sizes.

"Secondly, that the vehicle shall have three or four different ability ratings, these ratings, of course, are to take in a speed."

Pierre Schon, General Motors Truck Company: "The problem of rating truck chassis as presented by Mr. Pulcher has been a subject of considerable discussion during the past few years. Mr. Pulcher has suggested three angles of approach in arriving at a method of standardization in ratings.

"Conservative ratings, both manufacturer and customer agreeing that the vehicle is capable of carrying a considerable overload. Analyzing this method, we have nothing more or less than the practice used from the very early days of commercial vehicle transportation and followed by all manufacturers as long as solid tires were generally used as standard equipment, at least on the trucks in the medium and heavy duty range. These vehicles traveling at comparatively slow speeds were able to carry considerable overloads and there was a mutual understanding between manufacturers and the truck operators that any kind of truck would carry from 50 to 100 per cent. overload quite safely at these slow speeds on solid tires.

"It must be admitted that this method of rating trucks by tons of payload capacity resulted in some of the evils under which the industry has been suffering for a good many years.

"In Mr. Pulcher's paper the second rating method reads as follows:

"'A maximum rating—of what the vehicle will safely carry under average operating conditions.'

"Evidently this recommendation is based on establishing a maximum payload rating, exclusive of chassis and body weights. While this would probably be a long step toward eliminating of the uncertainty of overload capacity, we still have to deal with the immense variables in body weights. With an extremely heavy body, for instance, the maximum payload rating certainly could not be taken as actual payload capacity.

"The third method recommended in this paper, reads as follows:—

"'Abolition of rating entirely, and substitution of the maximum gross allowable weight.'

"Unquestionably, this is the correct and most practical method of rating a motor truck chassis.

"The method of maximum gross ratings eliminates all uncertainties, especially when operating conditions are taken into consideration and classified as follows:—

"1. Favorable.

"2. Normal.

"3. Severe.

"In order to use the maximum gross weight rating method properly it is entirely possible to give a chassis several different ratings, based on operating conditions and tire equipment. The maximum gross rating under this schedule applies to favorable operating conditions and the largest size of balloon tires released by the designing engineers for that particular chassis, while lower ratings may be placed on the same chassis when operating conditions are more severe.

"In so far as devising a standardized method which may be used as a guide for the different manufacturers in rating their vehicles, it is very doubtful if the society or any other organization would be willing or even capable of mastering such a task. For the past twenty-five years the industry progressed without any official rating bureau, leaving the matter of rating truck chassis up to the individual manufacturers' organization, in most cases the desired ratings being established by the president or the sales department executives.

"The new method of rating trucks by their maximum gross weight is entirely in the hands of the designing engineer, and we must admit that this policy is much safer and more practical for both the manufacturer and the operator."

A. J. Scaiffe, White Motor Company, B. B. Bachman, Autocar Company, M. C. Horrine, International Motors Company; W. D. Reese, General Motors Truck Company, also joined in the discussion.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

MONTH TO MONTH GAINS SINCE NOV. DODGE RECORD

Detroit, June 15.—Keeping pace with the steady improvement in general business throughout the country, retail deliveries of Dodge Brothers six and eight cylinder passenger cars since last November have shown consistent and substantial month to month increases, according to figures just released by General Sales Manager A. vanDer Zee of Dodge Brothers Corporation.

December, as compared to November, registered an increase of 29.6 per cent.; January over December 14.3 per cent. February over January 23 per cent., March over February 49.3 per cent., and April over March 22.6 per cent.

Figures covering overall deliveries, Dodge and Plymouth passenger cars, Dodge Brothers trucks, buses and taxicabs, also registered consistent monthly increases since the first of the year, January beating December by 9.5 per cent., February over January 19.2 per cent., March over February 43.3 per cent., and April over March 23.4 per cent. Preliminary figures for the month of May indicate continued increases.

Complete Technical Program Of S. A. E. Meeting

(Continued from Page 6)

Air-Cooled Cylinder Head Design—Roland Chilton, Wright Aeronautical Corporation

Recent Valve Developments—A. T. Colwell, Thompson Products, Inc.

10.00 A. M. Ballroom

CHASSIS

E. S. Marks, Chairman

The Tire Factor in Automobile Riding Quality—R. W. Brown, Firestone Tire and Rubber Company

Road Tests With the New Wabblemeter—Dr. F. A. Moss, George Washington University

Some Observations on Riding Qualities—Dr. Ammon Swope and Prof. H. M. Jacklin, Purdue University

Instrumentation as a Means for Co-ordinating Chassis and Body Design—A. F. Denham, Automotive Industries

2.00 P. M. **Aviation Demonstrations**

8.30 P. M. Auditorium

GENERAL PRODUCTION SESSION

E. K. Wennerlund, Chairman

Cost to Industry of Labor Turnover—H. L. Horning, Waukesha Motor Co.

10.30 P. M. **Grand Ball** Ballroom

FRIDAY, JUNE 19

10.00 A. M. Auditorium

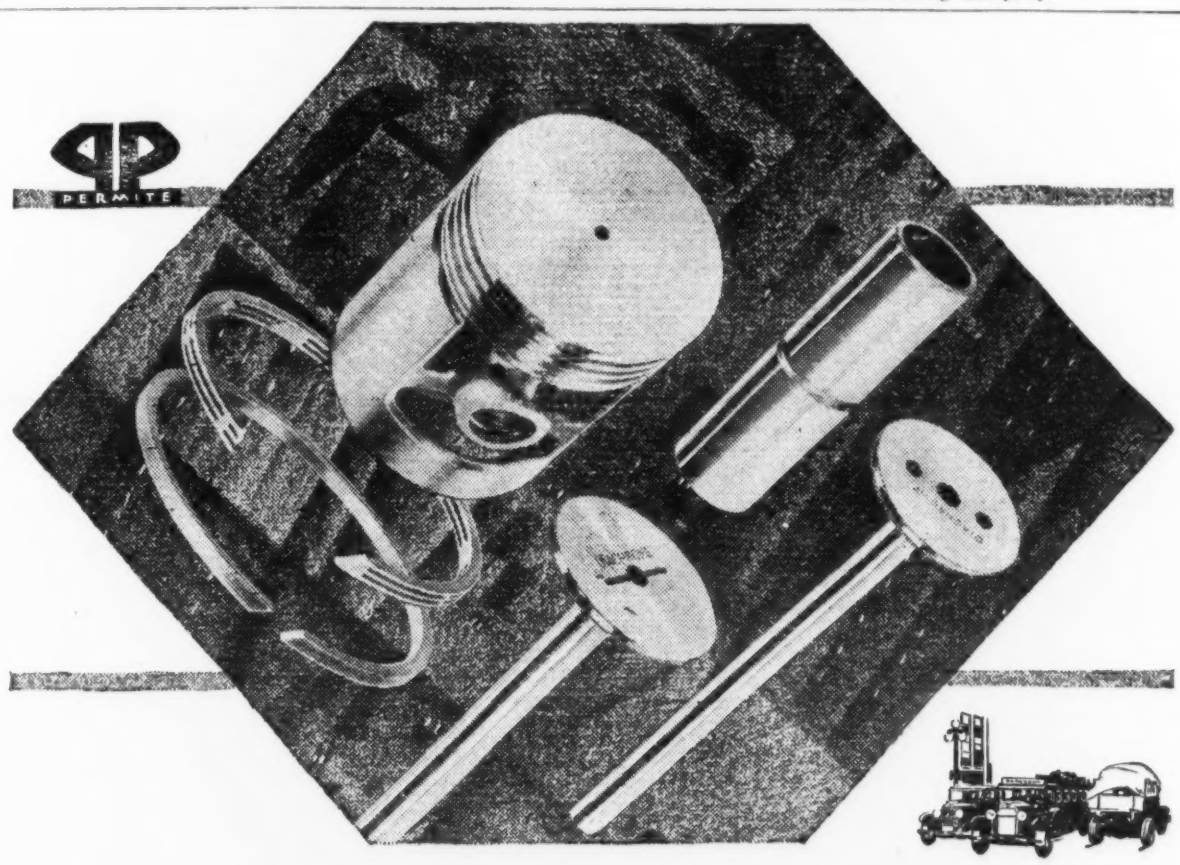
ENGINES

G. C. Brown, Chairman

Oil Control in the Engine—H. C. Mougey, General Motors Corporation

Winter Starting Tests—P. J. Kent, Chrysler Corporation.

Reduction of Fan Noise and Fan Power—A. D. Gardner, Automotive Fan and Bearing Company.



USED BY THE MAKERS
OF OVER A MILLION CARS PER YEAR

THE PERMITE LINE
Permite Alloy Pistons
Permite Semi-Steel Pistons
Permite Diachrome Valves
Permite Piston Rings
Permite Piston Pins
Permite Bolts
Permite Bushings
Permite Mufflers
Permite Water Pump Parts

ALUMINUM INDUSTRIES, INC.
CINCINNATI, OHIO, U. S. A., Cable Alini Cincinnati
makers of aluminum, steel and bronze products

INTELLIGENT research, practical testing, careful inspection—this is the combination which achieves quality, proves quality, and keeps quality.

In Permite factories, each essential is a definite policy—recognized and accepted by the entire organization.

So, it is no wonder that Permite Products have won the widespread approval of the industry of which they are a part. It is no wonder the makers of more than a million cars a year use Permite Products as original equipment.

PERMITE PRODUCTS

USED BY THE MAKERS OF OVER A MILLION CARS PER YEAR

Streamline Design

(Continued from Page 12)

half-way station. The automobile of the future will no more look like the motor car of today than the limousine of 1913 looks like the dos-a-dos carriage of 1896. In outward appearance, the car of the future will resemble a submarine boat on wheels more than it does a carriage."

Yet the 1913 general appearance and arrangement, as illustrated in Fig. 1, has been little changed in the eighteen years which brought us to 1931, and we hesitate now, not because we do not know what ought to be done or how to do it, but because the next desirable step seems to involve something of radical departure, both in appearance and in arrangement of mechanical units, especially that business of moving the engine from the front to the rear.

I am inclined to the view, however, there are times when radical steps in improvement are both desirable and necessary in order to preserve our status quo as the most favored suppliers of transportation.

Following extended layout determination of the best possible chassis arrangement and the building of accurate quarter-size models, our interest centered in wind-tunnel tests to check or disprove our theories on wind resistance. You will be surprised, as we were, that the results of the tests exceeded our fondest expectations.

Table No. 1

COMPARATIVE WIND RESISTANCE TESTS ON CONVENTIONAL AND TEAR DROP DESIGNS

Air Velocity M. P. H.	Conven'l Sedan Drag lbs.	Tear Drop Sedan Drag lbs.	Ratio Drag of Conven'l Sedan to Tear Drop Sedan
90	30.3	11.4	2.66 to 1
80	25.1	9.4	2.67 to 1
70	19.1	7.5	2.55 to 1
60	15.1	5.9	2.56 to 1
50	11.2	4.3	2.60 to 1

In this design, of course, engine location at the rear with direct drive to the rear axle is essential.

Table No. 1 gives the results of our comparative wind resistance tests in pounds of drag for the conventional and the tear-drop models at various air speeds of 90, 80, 70, 60 and 50 m. p. h. In the column at the right is given the ratio of the drag of the conventional sedan compared with that of the tear-drop car. Two remarkable facts stand forth at first glances:

1. The conventional sedan has resistance or drag, due to the wind, something over two and one-half times that of a car streamlined according to the design shown.

2. The superiority of the tear-drop design as to decreased drag remains approximately proportionately the same regardless of speed. In other words, the wind resistance of the conventional design is approximately two and one-half times that of the tear-drop design at any speed.

The values found in subsequent tests on the tear-drop car with front fenders and triangular fairings removed indicated at once great possibilities in eliminating front-fender effect, both as regards drag and front-end lift.

In considering the above results and the possible improvements indicated thereby, please bear in mind, always, that this model was only our first guess, scientific, of course, and based upon considerable experience and study. Subsequent considerations have indicated changes that should decrease the air resistance another 25 per cent. and improve the general stability of the car at high speeds without sacrifice in appearance or comfort. A surprisingly large number of modifications of the general appearance can be made to suit individual tastes without objectionable sacrifice in efficiency.

Fig. 3 shows one of the layouts for a rear-axle combination, incorporating engine, transmission and differential in an independently sprung unit, over a split, dead rear axle. Radiator and gasoline tank are in the rear compartment. This combination or any of its details is not urged, nor is it at all essential to our general idea; a dozen different designs of engine and rear axle combinations have been laid out or built, and any one of these may be satisfactory with modifications for installation in the ample rear compartment of a tear-drop car.

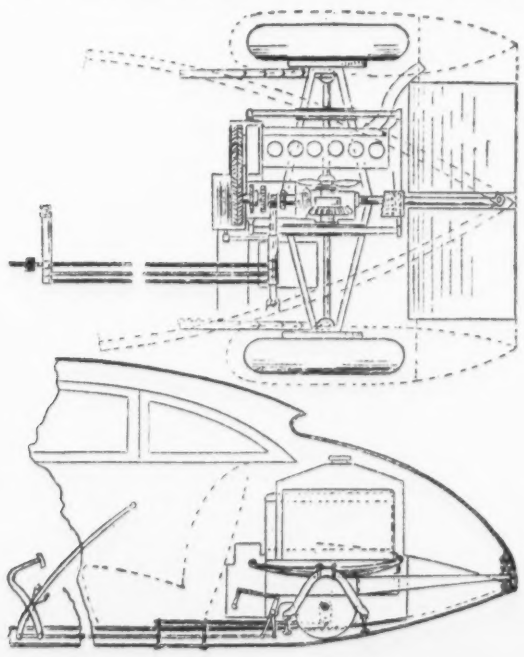


Fig. 3. Rear engine, independently sprung on split dead real axle

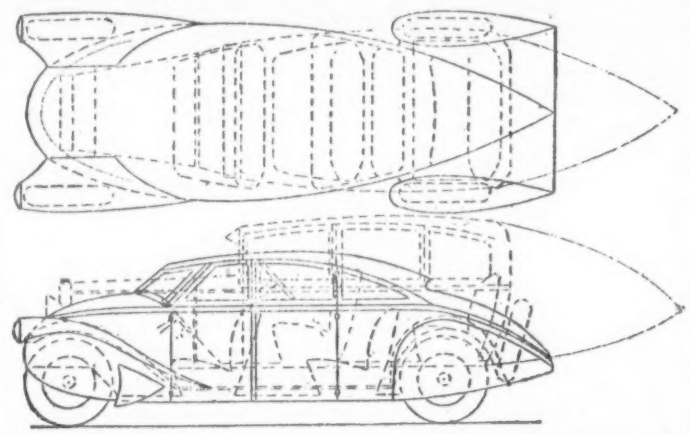


Fig. 4. Standard sedan as "tear-drop" car of same wheel base and capacity superimposed for dimensional comparison

TABLE 2

COMPARATIVE DIMENSIONS

for

TEAR DROP AND CONVENTIONAL SEDANS

Dimension	Tear Drop Sedan (January 14, 1930)	Convent'l Small Sedan	Convent'l Large Sedan
Wheel base	125 in.	103½ in.	136 in.
Road clearance	8½ in.	8¾ in.	8½ in.
Overall height	60 in.	71¼ in.	74¼ in.
Overall length (including bumpers and truck)	194 in.	156 in.	212 in.
Overall width	68 in.	67 in.	70 in.
Inside width of body	56 in.	55 in.	58 in.
Tread	56 in.	56 in.	58 in.
Height—Ground to floor	10 in.	22½ in.	26 in.
Ground to bottom of window.	42 in.	48 in.	51 in.
Seat cushion to roof (front)	37 in.	35½ in.	37 in.
(rear)	36 in.	35 in.	35½ in.
Height of side glass	12 in. max.	14½ in. max.	14 in. max.
Capacity of storage space	8½ cu. ft.	4¾ cu. ft.	6 cu. ft.
Frontal area	23 sq. ft.	24½ sq. ft.	26 sq. ft.
Diameter of wheel rim	18 in.	19 in.	20 in.
Diameter of tire section	6 in.	4¾ in.	7 in.

Note.—Seat dimensions, seat spacing and head clearance in Tear Drop Sedan are the same as in Conventional Large Sedan.

Table 2 presents in tabular form the dimensions of the tear-drop car compared first with those of a standard small sedan, and, secondly, with those of a standard large sedan of the same capacity.

Fig. 4 shows, in an instructive way, a standard medium sized sedan superimposed upon the tear-drop design. It is interesting to note that the wheelbase is the same, the overall length approximately the same, and the overhanging front and rear approximately the same. It is more interesting, perhaps, to note the striking differences in total height of car, low center of gravity and location of seats relative to front and rear axles.

The dotted lines at the rear show the tremendous overhang which would result if an attempt were made to streamline the rear end of a conventional sedan to obtain comparable elimination of rear-end drag.

Now, it is well understood that the total resistance of an automobile at any speed is made up of its inherent frictional resistance plus its wind resistance.

Knowing experimentally the frictional resistance and the ratio between wind resistances, we can, by use of equations, determine the total road resistance in pounds for both conventional and tear-drop cars at various speeds.

Table 3 shows the results of such calculations for the two designs in question. The obviously interesting point is that the total road resistance of the conventional design varies from 1.7 to 2.3 times that of the tear-drop design as the speeds are varied from 40 to 90 m. p. h.

TABLE 3

TOTAL ROAD RESISTANCES FOR CONVENTIONAL AND TEAR DROP DESIGNS

(Based on known constants and equations and comparative wind tunnel results)

TOTAL ROAD RESISTANCE (F)

Speed In M.P.H. (B)	Conv't'l Sedan (Lbs.)	Tear-Drop Sedan (Lbs.)	Ratio Convent'l Sedan, to Tear Drop Sed.
90	425	182	2.3 to 1
80	342	150	2.3 to 1
70	270	127	2.1 to 1
60	203	103	2.0 to 1
50	155	81	1.9 to 1
40	112	65	1.7 to 1

And, inasmuch as horsepower and fuel required therefor at any speed vary roughly as the total resistance to be overcome, it results that the tear-drop car at touring speeds will run approximately twice as far on a gallon of gasoline as the conventional sedan.

Accurate experimental tests covering both drag and lift effects, front and rear, have been conducted upon variations of the tear-drop car with the front fenders removed, with the windshield angle filled in flush, with the rear-vision window angle eliminated, with different contour of the underbody—and these tests point the way to further improvement.

There were obvious reasons for these past failures in streamlining, which are, or can be, eliminated now, as follows:

(1) Streamlining attempts in the past were more or less grotesque, or at least lacking in beauty and artistic symmetry of line and contour. (Here the author illustrated and discussed some earlier types.—Ed.)

(2) The public and even automobile manufacturers were not accustomed to streamlined structures. Today they are not only accustomed to full streamlined structures, but they like them.

(3) The advantages to be gained in the full streamlined rearranged automobile were heretofore unknown to public and manufacturer alike. Today, data upon these advantages are available and authentic.

One technical aerodynamic point deserves consideration, although it is believed that the inherent operating conditions of the automobile, as distinguished from those of airplanes or airships, will eliminate the possibility of objectionable characteristics from this viewpoint. A body like an airship or an airplane, traveling freely, in air or water and without directing and controlling contact such as is afforded by a roadbed, depends to a considerable extent for its stability and smooth directional travel upon the relative locations of its center of gravity and its center of resultant wind pressure at any given instant.

If such a freely traveling body is designed and proportioned so that, as it tends to deviate from its direction of motion, or as the resultant wind varies from straight ahead, its center of gravity remains ahead of its center of wind pressure, there results a righting couple tending automatically to return the body to its original alignment. This is of considerable importance in airplane and dirigible flight or that of free projectiles in general, but it is not believed to be critical in a tear-drop automobile design for the following reasons:

(1) Due to the directing and controlling contact of the loaded front wheels of an automobile on the roadbed, stability and smooth directional travel can be maintained even in the absence of considerable righting couples.

(2) With the front seats located well forward in the body, with ample storage space in the extreme front end, in which will be located the extra wheel and tire, tools and baggage, and, furthermore, with the rear seats, the battery and at least a part of the engine unit located ahead of the rear axle, the front axle will be well loaded, and the center of gravity should be far enough forward to at least avoid any noticeably disturbing couples at high speed.

To sum up, present-day automobiles, both in appearance and general arrangement, were designed 20 to 30 years ago when conditions of speed and operating economy were relatively of little or no importance.

Today, high speed and economy and maximum comfort are demanded. The automotive industry and the automotive engineer have available the answer in the rear-engined, low-center-of-gravity, streamlined tear-drop car.

Outstanding advantages result as follows:

(1) Twice as many miles per gallon of gasoline, due to decreased wind resistance.

(2) Clear vision, due to removal of the engine unit from the front end.

(3) Elimination of engine noise, vibration and odors, due to location of the engine behind the passenger compartment and its separate spring suspension.

(4) Increased riding comfort, due to location of the center of gravity and the seats between the axles.

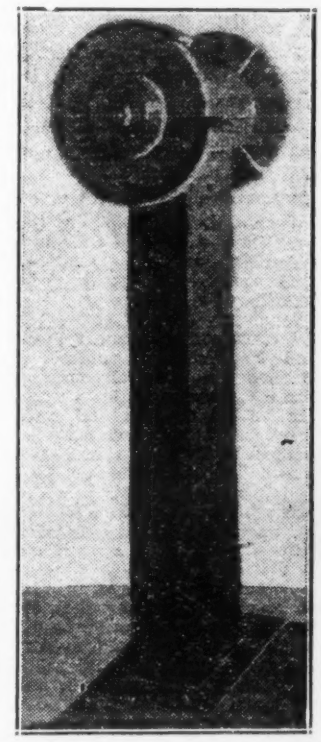
(5) Unit trussed-body construction, with elimination of conventional chassis frame.

(6) Low cost. Body, chassis and assembly simplified.

(7) Beauty and grace, due to artistic streamlining.

Such results cannot be had by rounding a corner here, adding a molding there or by trying to rework all production dies which are not entirely worn out.

NEW TOOL GRINDER OF WELDED STEEL



FORBES & MYERS electric grinder of welded steel construction

An electric tool grinder of welded steel construction is the development of Forbes & Myers. It is claimed to be 175 lbs. lighter than similar grinders of conventional construction without a reduction in strength and to be available at a saving of $50 in price.

The grinder wheels are 10 x 1 in. and operate at 1800 r.p.m. A tool rest is provided on the left end only, and is adjustable in two directions. The right wheel has a large opening in the guard for work which cannot be handled on the regular tool rest. Both wheels have permanent guards.

Ball-bearing mountings are used. An induction type motor is provided for 110, 220, 440 or 550 volts, 1, 2 or 3 phase, 25 or 60 cycle current. Other motors can be supplied if desired.

The switch is mounted in the base. Knockouts are provided at several convenient points for connecting power wires.

M'COLLUM IMPROVES ELECTRIC HOIST

Improvements have recently been made in the "Mac" universal electric hoist manufactured by the McCollum Hoist and Manufacturing Company, Downers Grove, Ill., in order to increase the efficiency and life of the gearing and to reduce noise. The hoist is made in capacities from 500 to 4,000 pounds, and can be had in ether the hook or trolley type.

FORMS OWN BUSINESS

Jamestown, N. Y., June 15.—George M. Hambelton, who recently resigned as general manager of sales for the Kettle Motor Sales, Inc., Buick-Oakland-Pontiac distributor, has established a used car sales and service at East 2d and Buffalo Streets.

CHRYSLER ADVERTISING APPOINTMENTS REVEALED

Detroit, June 15.—The appointment of H. M. Hamilton as manager of retail sales promotion; F. C. Himmelman as manager of wholesale sales promotion and the connection of R. M. Walker with the advertising department of Chrysler Sales Corporation in charge of the production of all advertising literature, is announced today by J. W. Frazer, general sales manager.

The appointees have all been with Chrysler for some time. Mr. Hamilton has been in the advertising department of the corporation for the past two years, before that having been in automotive advertising of motor car manufacturers and agency work.

Mr. Himmelman came to Chrysler several years ago from the advertising department of J. L. Hudson Company. Mr. Walker has been in the sales educational department of Chrysler Corporation prior to his new connection with Chrysler Sales Corporation.

Foreign Trade Opportunities

Washington, D. C., June 15.—Foreign automotive trade opportunities just announced by the automotive division of the bureau of foreign and domestic commerce of the Department of Commerce are listed below.

Additional information may be obtained from the bureau and its district and co-operative offices, by duly registered firms or individuals upon written request, giving the opportunity number.

51467—Goteborg, Sweden; agency for automobile accessories.

51515—Tangier, Morocco; agency for automobile accessories.

51470—Milan, Italy; agency or purchase of automobile accessories and novelties.

51471—Rotterdam, Netherlands; agency or purchase of automobile garage equipment.

51542—Paris, France; agency for automobile service station equipment.

51522—Montreal, Canada; agency for automobile spotlights.

51469—Halifax, Canada; agency or purchase of automobile tire chains.

51606—Milan, Italy; agency or purchase of automobile top fasteners.

51543—Berlin, Germany; agency for automobiles, medium priced.

51573—Brussels, Belgium; agency for motors, gas oil, Diesel, for trucks.

51541—Buenos Aires, Argentina; agency for trucks and truck bodies adapted for "dry ice" refrigeration.

51706—Brandenburg, Germany; agency or purchase of automobile accessories, parts, tools and garage equipment.

51612—Winnipeg, Canada; agency for automobile flag holders.

51611—Brussels, Belgium; agency and purchase of automobile novelties and spare parts.

51618—Santiago, Chile; purchase of automobile replacement parts.

51610—Milan, Italy; agency for automobile and motorcycle accessories and automobile body supplies.

51727—Vienna, Austria; agency for automobile accessories.

51728—Roubaix, France; agency for automobile accessories.

51731—Toronto, Canada; agency for automobile accessories.

51743—Berlin, Germany; agency and purchase of automobile accessories and parts.

51824—Heilbronn, Germany; agency for automobile gaskets and brake linings.

51783—Johannesburg, South Africa; agency for automobile replacement parts.

51784—Brussels, Belgium; agency and purchase of automobile and motorcycle accessories and spare parts.

51729—Turin, Italy; agency and purchase of meters, taxicabs, which issue a receipt.

51730—Lisbon, Portugal; purchase of trucks, motor.

51827—Buenos Aires, Argentina; purchase of trucks with refrigerator installation.

51854—Barcelona, Spain; agency for automobile accessories.

51839—Hamburg, Germany; agency of purcase of automobile accessories, repair parts and service-station equipment.

Contemporary Comment

THE number of traffic light signals in New York city is constantly being increased as one of the most effective measures for street accident prevention.

In 1925 there were sixty-six traffic lights in the city, as compared with 5,453 intersections controlled by traffic lights on December 31, 1930. Additional systems already planned will increase the number of signal controlled intersections to 8,827. These signals provide control at points for which 27,000 policemen would be required if the same control for the same hours were not possible with mechanical means.

While the rapid extension of the traffic signal system provides an additional measure of protection for pedestrians, the number of accidents listed under the cause "Pedestrian Crossing Against Traffic Lights" is constantly increasing.

Traffic signals are not installed only to regulate vehicular traffic. Their primary purpose is to provide protection for pedestrians. Without the co-operation of the walking public the efforts of the city authorities to give this protection are futile.

The signals are now operating on short time cycles, which reduces greatly the waits necessary for pedestrians. The time saved by crossing in disregard of the signals is so inconsiderable that it does not warrant the hazard involved.—**Street Accidents.**

WITH the record huge stocks of low price rubber on hand at the present time the occasion would seem opportune to push the development of rubber paving to the limit. It is encouraging to hear that the municipal commissioners of Singapore are providing an opportunity for further experiments, and a section 30 yards by 18 feet is to be laid at a cost of $200. While this appears to be a somewhat niggardly sum, it is presumed that if the tests are satisfactory more areas will be developed.

The Rubber Research Institute of Malaya is also getting into action in this connection and is conducting a series of tests on various types of rubber paving to determine which of the many proposals and inventions which have been put forward, have merit sufficient to warrant further experimentation.

The latest development in rubber paving is toward the use of liquid latex in combination with other materials, making a preparation not unlike asphalt or macadam, which might be laid down in much the same manner as those two materials. As the Malayan Tin and Rubber Journal puts it, if such inventions could be developed and prove satisfactory, "a wonderful avenue will be opened up and the rubber industry will enjoy a gloriously long period of prosperity, to say nothing of Arabian nights for planters."—**The Rubber Age.**

* * *

STEEL demand is approaching irreducible minimum and consumption goods are needed right along. From this it would appear that there will be relatively little further decrease in steel demand during the summer. Pipe mills report an increase.—**New York Evening Post.**

You'll be Happier with CHRYSLER

Smarter cars to show
Better cars to demonstrate
Bigger variety of models
Greater range of prices
Stronger factory support

PLYMOUTH $535 to $645 • CHRYSLER SIX $885 to $935

CHRYSLER "70" $1245 to $1295 • CHRYSLER EIGHT $1495 to $1665

CHRYSLER EIGHT DE LUXE $1525 to $1585 • CHRYSLER IMPERIAL EIGHT $2745 to $3575

All prices f. o. b. factory

CHRYSLER SALES CORPORATION, DETROIT

S.A.E. BUCKLES DOWN TO TECHNICAL PROGRAM AFTER BATTLE ON LINKS

(Continued from Page 1)

Detroit on the "Utilization of Motor Coaches."

The Diesel engine session will be held this evening and members will then adjourn to the swimming pool to participate in the water carnival.

The feature of the golf play yesterday was the blind par two ball sweepstakes in which two members, J. P. Stewart, of the Vacuum Oil Company, and Ray F. Townsend tied for first prize. Their scores were 78. Second prize was split three ways among F. H. Martin, Stewart Warner Corporation; Gordon Brown, Bakelite; Sanford Brown, Bakelite.

Ideal golf weather prevailed during the morning and the hotel lobby and rooms were deserted. Intermittent showers dampened the play in the afternoon.

Vincent Bendix, president of the S. A. E., arrived this morning and is now installed in his lofty penthouse atop the Greenbrier Hotel.

H. W. Alden of the Timken Detroit Axle Company was one of the early arrivals on Saturday. Mr. Alden is one of the founder members of the society, and had just completed a drive of 420 miles in order to reach the convention early. To avoid sheriffs on the way back we won't say how quickly he made the trip.

Mr. and Mrs. O. A. Parker of the Parker Wheel Company, Cleveland, O., also arrived by car Saturday afternoon, completing the 440-mile run in two short hops, four hours one day and seven the next.

The roll call of the convention was augmented by arrivals yesterday morning of Harry E. Figgie of the Standard Steel Spring Company, accompanied by Mrs. Figgie and their son, Harry, Jr., and daughter, Dorothy.

David Beecroft, veteran summer meetinger, now with the Bendix Aviation Corporation, was among the early birds on the links yesterday and among the last to leave.

C. T. (Connie) Myers of the Chassis Lubricating Company decided at the last minute to grace the Greenbrier with his presence. He got in touch with the railway officials and had the S. A. E. special stopped at Rahway, N. J., to pick him up.

J. H. McDuffee of the Prest O Lite Storage Battery Company had the distinction of being the first arrival at the meeting by air. McDuffee reported a stormy trip in from Cleveland when at times they were forced to fly at 11,000 feet to avoid violent rain.

Guy Motz, Detroit S. A. E., indulged in his usual horseback ride soon after registering at the hotel yesterday.

John Warner, general manager of the S. A. E., had a busy day, but still found time for a round of golf.

A. W. Anderson of Borg & Beck, chairman of the golf committee, turned in a score of 80 for his qualifying round.

The daily S. A. E., which is being published this year by E. G. Budd Manufacturing Company under the supervision of Griscom Bettle, is attracting wide comment. The S. A. E. has gone tabloid, and we congratulate the staff for turning out an exceptionally good job under most trying circumstances.

CONNECTICUT FOUNDRYMEN ELECT NEWMANN LEADER

East Hampton, Conn., June 15.—The Connecticut Foundrymen's Association, which includes a number of men engaged in automotive manufacture, elected C. S. Newmann of New Britain as president at the annual meeting at Kayrock Inn here. Bert Spencer of Meriden was named vice-president, A. S. Parker of Meriden, secretary, and George R. Holmes, New Haven, secretary.

CLEMENTS NOMINATED TO HEAD A. S. T. M.

Nomination of Frank O. Clements, technical director of the research laboratories of the General Motors Corporation, for the presidency of the American Society of Testing Materials, composed of scientists, engineers, manufacturers and testing experts throughout the world, was announced yesterday by C. L. Warwick of Philadelphia, secretary-treasurer of the society.

Mr. Clements' nomination, by which he will succeed K. C. Mackenzie, consulting chemist for the Texas Company, is tantamount to election, since the society customarily elects choices of the nominating committee.

MOVES USED CAR UNIT

Jamestown, N. Y., June 15.—The Kettle Motor Sales, Inc., Buick-Oakland-Pontiac distributor, with salesroom and service station in Washington Street, has removed its used car division to the corner of 4th and Clinton Streets, just a block from the business section. A large tent has been erected on the lot, and all used car activities are carried on from the new location. David Foxe is general sales manager.

SPARKS

(Continued from Page 2)

$1,395 runabout. As a matter of fact, a boat of that size does not need safety glass, but we are putting it on because of public demand. We found that the public has been so thoroughly educated as to the merits of safety glass that it is demanding that we give it to them. I consider this demand as proving that the safety glass manufacturers are doing the best kind of a job in waking up the people to the needs of such protection against possible accidents caused by flying glass."

* * *

WHILE we are talking about motorboats, we note with interest that one of the contestants in the outboard race in the Kearsley Lake water carnival this week will be Miss Florence Burman, daughter of Wild Bob Burman, killed in the Corona road race in 1916. Miss Burman also is learning to fly—a chip off the old block.

No more colorful pilot ever donned racing goggles than this same Wild Bob, a factory product, whose driving skill was unquestioned, but whose heavy foot robbed him of many a victory. If the car stood the punishment Bob gave it, it was the winner; otherwise it was just too bad.

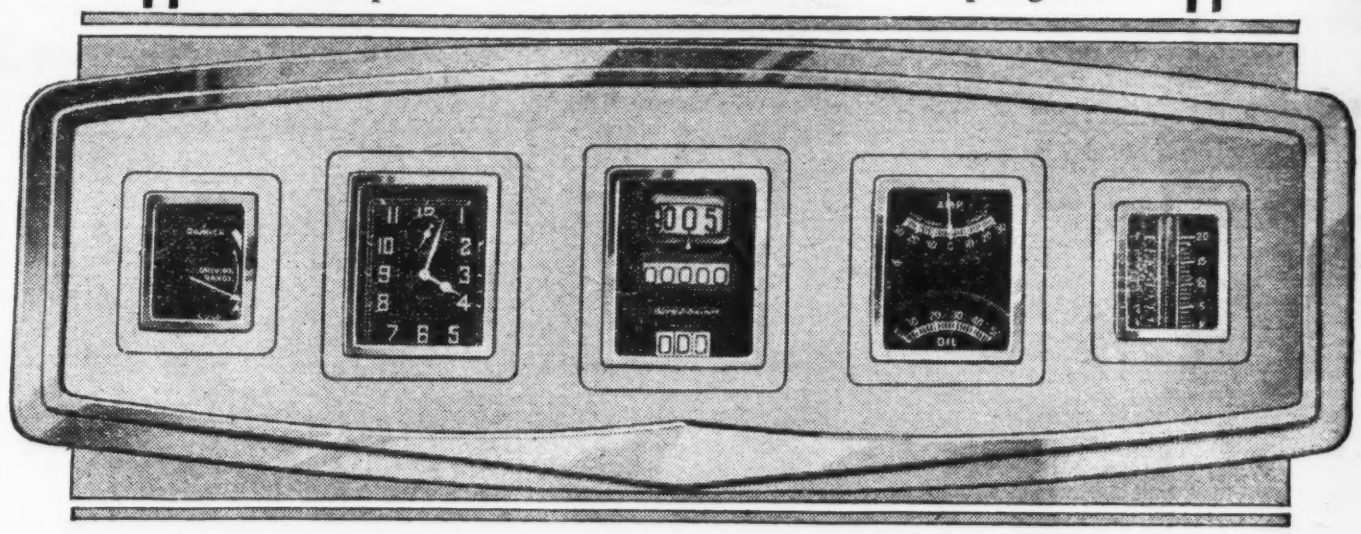
Burman originally was a painter who got a job with Buick when Dave Buick was head of the company and he was still there when W. C. Durant came along. But over at Jackson the makers of the Jackson, the "no hill too steep, no sand too deep" car, were paying more money, so Bob went there, took a car to the Grosse Point races here, cleaned up, and he was off on his brilliant career.

Durant called him back to Buick and he, along with Louis Chevrolet and Lewis Strang, made up that sensational team that Durant put out in 1908. From that time until he was killed, Burman was one of the truly great. In the Corona road race he hit a telephone post, which snapped off and fell in the car, killing the mechanic and mortally injuring Bob.

STEWART WARNER

TRAFFIC TESTED PRODUCTS

Speedometers
Instrument Panels
Mechanical Fuel Pumps
Electric Fuel Pumps
Vacuum Tanks
Bumpers
Shock Absorbers
Horns
Cigar Lighters
Spotlights



Featuring the

STEWART-WARNER INSTRUMENT PANELS

An added mark of distinction notable on fine cars of today is the Stewart-Warner Instrument Panel. These panels are of dependable Stewart-Warner quality—and are furnished in any type, size or design specified, complete with the Stewart-Warner Speedometer and other instruments, ready for immediate installation. Our engineers will gladly co-operate with you in designing distinctive panel equipment for your cars. Stewart-Warner Corporation, Chicago, U. S. A.

Built by the Largest Manufacturer of Automobile Accessories in the World